A WOMAN IN THE LABOR FORCE: FACTORS AFFECTING BOTH HER LABOR FORCE DECISION AND THE TIME SHE IS WILLING TO SUPPLY IN THE LABOR MARKET

Decorah, Marlys Knutson

By

MARLYS ANN KNUTSON

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Luther College

Decorah, Iowa

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Thesis Approved:

Dean F. Schreiner
Thesis Adviser

Gerald O. Doelser

R. Shaw Smith

D D Durham
Dean of the Graduate College

PREFACE

This study is concerned with an analysis of a woman's labor force decision and the time she is willing to supply to the labor force once she has decided to participate. Factors affecting her decision and her supply of working time are employed as independent variables in regression analyses of data on women 30 to 44 years of age collected in the National Longitudinal Surveys, taken by The Ohio State University's Center for Human Resource Research, directed by Herbert S. Parnes. An analysis of annual income of those women at work is also presented with special interest in factors causing differentials by residence.

The author wishes to express her appreciation to her major adviser, Dr. Dean F. Schreiner, for his guidance and assistance throughout this study. Appreciation is also expressed to Dr. Gerald A. Doeksen and Dr. Richard E. Just for their helpful suggestions and assistance in the preparation of the final manuscript.

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CHAPTER I

INTRODUCTION

Statement of the Problem

The influences of society have always played a large role in the determination of human behavior, especially in the United States. A woman's decision to enter or not to enter the labor force is no exception. Society's attitudes toward women working have been changing over the years. With the advent of the women's liberation movement, more women are becoming aware of the alternatives to working in the home. Their reasons for entering the labor force are varied - to augment the family income, for personal satisfaction, to keep busy now that the children have grown up and left home - but, nevertheless, they are entering.

The very nature of the work force is changing with the increasing participation of women, in general, and married women over thirty years of age, in particular.

> Today nearly 2 out of every 5 American workers are women. Most of these women are married, and half are over 39 years old. Since 1960, nearly half of the increase in the labor force was accounted for by married women. In early 1970, over 18 million married women were working or looking for work, representing about 60 percent of the female labor force. In 1940, these figures were 4.2 million and 30 percent. The 30-year increase of about 320 percent in the number of working wives far outstrips the 50 percent increase in the size of the population.[1]

Whatever the reasons, women are entering the labor force in ever growing numbers, as evidenced by the data presented in Table 1. This increase in the participation of women in general and married women in particular has been observed in both urban and rural areas. The developments in the urban areas, in fact, are greatly influencing those in adjacent rural areas. Proximity to urban industrial concentration affects the female labor market in that it affords an opportunity to the women previously employed in strictly farm work to shift to part- or full-time nonfarm occupations. This is especially true since employment agencies seem to be most effective on a local level and word of job opportunities travels, more often than not, through newspapers, personal contacts, and word of mouth [14, pp. 3-5].

As can be seen by the data in Table I, besides the increasing labor force participation rates of women in the United States as a whole, female participation has been increasing, percentage-wise, in all its parts - urban, rural nonfarm, and rural farm. The participation rate of the urban sections, however, has always been larger than that of the rural nonfarm, which, in turn, has always been larger than that of the rural farm areas. It would seem that rural farm women are too involved in the operation of the farm to seek off-farm work or job opportunities are relatively scarce for them or the cost of commuting and the time it would take are not made up for by the income that could be earned if, indeed, they did find off-farm employment.

The questions then arise: What actually influences a woman's labor force participation decision? Does her place of residence significantly enter into that decision? And, if she does decide to enter the labor force, what amount of time is she willing to give up around

TABLE I

FEMALE LABOR FORCE, 16 YEARS AND OVER, BY MARITAL STATUS: 1950, 1960, AND 1970

United States Urban and Rural	1950[a] Number	1950[a] Participation Rate[b]	1960 Number	1960 Participation Rate	1970 Number	1970 Participation Rate
Total	16,551,990	29.0	22,221,588	35.7	30,546,667	41.4
Married	7,650,845	21.5	12,361,152	30.7	14,417,565	39.2
Single[c]	8,874,145	41.2	9,860,436	44.9	13,129,102	44.6
Urban						
Total	12,846,650	33.3	17,338,204	38.4	23,949,957	43.1
Married	5,616,665	24.2	9,124,329	32.4	12,951,399	40.4
Single	7,229,985	46.8	8,213,875	48.6	10,998,588	46.9
Rural Nonfarm						
Total	2,503,510	22.8	3,873,103	29.9	5,755,726	37.1
Married	1,386,355	19.2	2,555,614	28.4	3,881,009	37.6
Single	1,117,155	29.7	1,317,489	33.4	1,874,717	35.9
Rural Farm						
Total	1,201,830	16.0	1,010,281	23.9	840,984	29.9
Married	647,825	13.1	681,209	21.9	585,157	29.0
Single	527,005	22.6	329,072	29.6	255,827	32.3

[a]1950 data include females 14 and 15 years of age.

[b]The labor force participation rate is defined to be the labor force of any age group divided by the population of that age group.

[c]This category includes the never-married, married, spouse absent, widowed, divorced, and separated.

Source: U.S. Summary Detailed Characteristics for the census years 1950, 1960, and 1970.

the home? It is in an effort to shed some light on the answers to these questions that this study is undertaken.

Objectives of the Study

The general objectives of the study are to analyze the factors important in a woman's labor force participation decision, with special interest in the influence of place of residence, and to determine a demand function for the consumption time of the women surveyed. These objectives may be further broken down to include the following:

I. A review of the progress in recent years of the theory supply of working time.

II. A review of the results of previous studies on the influencing factors and forces behind the rise in female labor force participation to determine the factors seen to be relevant by other analysts in the woman's decision to work or not to work.

III. The formulation of a model concerning females' labor force participation from data gathered by a national survey of women in the age group 30 to 44.

   A. To determine the most important influencing factors for this subgroup of women and to compare these results with those of previous studies.

   B. To analyze the results of the inclusion of place of residence.

   C. To formulate a model concerning the income of the working women and how place of residence helps explain any existing variation.

IV. The formulation of a demand curve for the consumption time, or a supply curve of working time, of the women surveyed to determine the effects of certain factors - wage, other family income, children, and so forth - on the time the woman spends in the home, at leisure or in the production of home goods.

Procedures and Organization

In Chapter II two major approaches to the theory of the supply of working time are reviewed: the classical labor-leisure model and the household as a decision-making unit model. Conclusions are drawn with respect to female labor force participation.

Chapter III reviews recent studies concerned with factors influencing a woman's labor force decision. The work experience survey is described in Chapter IV with a descriptive analysis of the data on women 30 to 44 years of age employed in this study.

In Chapter V a brief summary of the regression methods used in the analysis of labor force participation is presented. The variables used in this study's analysis of the probability of labor force participation of a woman are described and results presented. A brief discussion of the results and conclusions drawn follows.

Chapter VI presents the results of the supply of working time (demand for consumption time) model and discussed the implications. Also presented are the results of the income differential model.

In Chapter VII all models are summarized. The important conclusions for each are presented and the possibilities for further research are discussed.

FOOTNOTES

[1]"Women at Work: Changes in the Labor Force Activity of Women," Monthly Labor Review, Vol. 93 (June, 1970), pp. 10-11.

CHAPTER II

REVIEW OF THE THEORY OF THE SUPPLY OF WORKING TIME

The Labor-Leisure Model

The logic of the labor supply is quite similar to that of consumer demand for goods. An individual in the "market" for leisure must choose between leisure and income in such a way as to product the maximum possible untility. An indifference map for the two goods, income and leisure, may be determined such as that in Figure 1.

One of the opportunities available to the worker is 168 hours per week of leisure and no earned income. For every hour less of leisure, he can have an additional income of one hours' wage. Therefore, opportunity lines for each wage may be drawn in and the equilibrium position for each determined. The higher the wage, the steeper the opportunity line. See Figure 1.

The points of equilibrium can then be taken from this indifference map to graph the relationship of hours of leisure per week to the hourly wage - the demand curve for leisure. It could be depicted as in Figure 2. Since leisure is, by definition, the time spent not working, it follows that the demand curve for leisure is also the supply curve of labor.

Perhaps the most wisely accepted hypothesis about the short-run supply curve of labor is that it is backward-bending above some wage

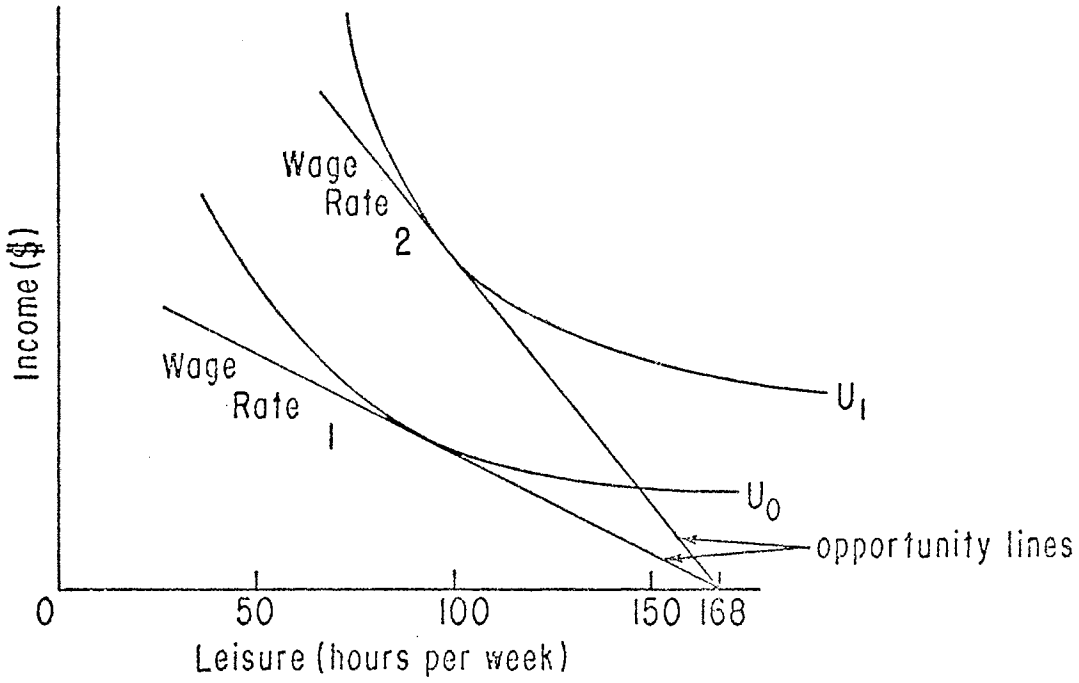


Figure 1. Indifference Curves - Leisure vs. Income

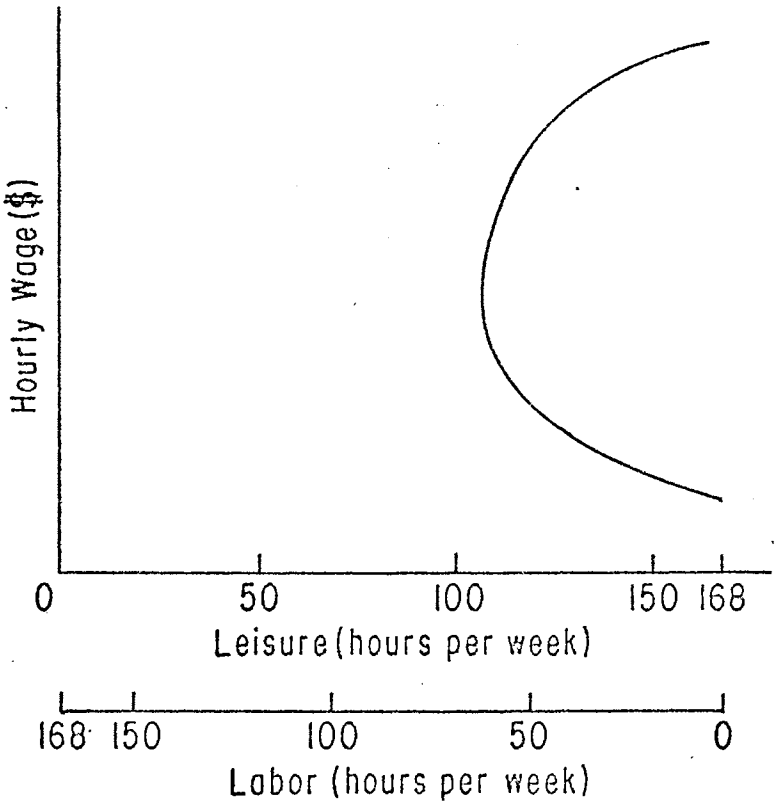


Figure 2. The Demand Curve for Leisure

rate. (Each point on the curve is to be interpreted as showing the maximum quantity offered at the given price, which is why the negatively sloped segment is said to be "backward-bending" rather than "forward-falling.") Looking at the demand curve for leisure, we see that the worker demands more leisure when the cost (in terms of lost wages) rises. In other words, higher income opportunities usually induce the worker to choose more leisure along with more income.

The theoretical explanation offered for the backward-bending segment of the supply curve is that a rise in the real wage rate arising from an increased demand for labor has two effects: (1) It makes leisure more expensive, since the cost of an hour of leisure is the wage that could be earned in that hour. This is the substitution effect, and by itself would tend to raise the number of hours worked. (2) If the individual were to work the same number of hours, the rise in the real wage rate increases his real income, which would lead him to want to purchase more of various kinds of goods, including leisure. This is the income effect, and by itself would tend to reduce the number of hours worked unless leisure is an inferior good. The argument, then, is that beyond some point the income effect dominates the substitution effect [12, p. 204].

An objection sometimes raised to this type of analysis is that individuals cannot determine for themselves the number of hours they work; this is an institutional datum which the individual must take or leave. But it may be seen that a particular individual has some leeway. He can work overtime or not, take off more or less time during the year, choose the kind of occupation or employer that offers the number of hours of work he wants, and so forth. The basic fallacy is that it

is not recognized that the individual in the labor market is like the perfect competitor: to each individual separately the number of hours of work per week may be fixed, yet the level at which it is fixed is the result of the choices of the individuals as a group. If at any moment this level of hours is, say larger than on the average people prefer at the given wage rate, this means that any employer who makes them shorter, who adjusts them to the workers' preferences, will make employment with him more attractive than employment with others. Hence he can attract the better people or attract people at a lower wage rate. Employers thus have an incentive to adjust working conditions and hours to the preferences of the workers. Competition in this way does permit individuals in effect to determine for themselves the number of hours they work.

The Household as a Decision-Making Unit

In recent years economists have come to recognize that a household is truly a "small factory" where both consumption and production take place, as opposed to the past when these activities were rigidly separated - production occurring in firms and consumption in households. This view, then, sees a household as combining capital goods, raw materials and labor to produce useful commodities. Undoubtedly the fundamental reason for the traditional separation is that firms are usually given control over working time in exchange for market goods, while "discretionary" control over market goods and consumption time is retained by households as they create their own utility.

The usual income-leisure analysis, seen in this framework, is an oversimplification of the relationship between hours of labor supplied

and the wage rate. The primary short-coming in the analysis lies in the implicit assumption of a strictly dichotomous relationship between the time spent in gainful employment and leisure or, alternatively, the implication that all time not spent in "pleasurable leisure" represents time spent in gainful employment. Furthermore, all time spent on the job represents leisure foregone. Failure to recognize that there exists a range of activities constituting neither gainful employment nor pleasurable leisure leads to overstatement of the possibility of a negatively sloped labor supply curve.

To overcome this short-coming, Gary S. Becker [3] introduced the concept of "consumption time" to a household decision-making unit model. The household viewed as a firm maximizes, according to traditional theory, utility functions of the form

$$U = U(y_1, y_2, \ldots, y_n) \tag{2.1}$$

subject to the resource constraint

$$\Sigma p_i' y_i = I = W + V \tag{2.2}$$

where y_i are goods purchased on the market, p_i' their prices, I is the money income, W is earnings and V is other income. Becker then departs from tradition to incorporate non-working time into his analysis.

In his formulation, households are both producing units and utility maximizers. Households are assumed to combine time and market goods to produce more basic commodities that directly enter their utility functions. Examples of such commodities are watching television, which combines the inputs of a television, cablevision (if available and used), and the viewer's time beyond the network's inputs to ready

the program for showing; another is eating which involves the market goods purchased at the grocery store plus the preparer's time and the time of the consumer(s). Becker calls these goods Z_i and sets up their production functions as

$$Z_i = f_i (x_i, T_i) \tag{2.3}$$

where x_i is a vector of market goods and T_i a vector of time inputs used in producing the i^{th} commodity.

The household then combines time and market goods via the "production functions" f_i to produce the basic commodities Z_i and chooses the best combination of these commodities in the conventional way by maximizing a utility function

$$U = U(Z_i,\ldots, Z_m) \equiv U(f_1,\ldots, f_m) \equiv U(x_1,\ldots, x_m; T_1,\ldots, T_m) \tag{2.4}$$

subject to a budget constraint

$$g(Z_i,\ldots, Z_m) = Z$$

where g is an expenditure function of Z_i and Z is the bound on resources.

William Bowen and T. A. Finegan [5] have modified Becker's analysis somewhat for their study of the labor force. They defined three categories of consumables: "market goods" (purchased for a price), "home goods" (child care, a clean house, etc., which are ordinarily regarded as involving "work" and which are produced and consumed at home), and "leisure" (hours not spent producing market goods or home goods). From there they assumed that the members of the household have collective "tastes" for market goods and home goods, for the amount of

leisure available to each family member, and for the specific market and home tasks which could be performed by each family member. Then the decision-making task of the household is to maximize a utility function of the form

$$U = U(q_1,\ldots,q_n;\ h_1,\ldots,h_m;\ G_{1\ell},\ldots,G_{pr};\ H_{1\ell},\ldots,H_{mr};\ L_1,\ldots,L_r \quad (2.6)$$

where

q_i = quantity of the i^{th} good purchased in the market;

h_j = quantity of the j^{th} good produced and consumed in the home;

$G_{\ell k}$ = hours of labor in the j^{th} home occupation supplied by the k^{th} family member (assuming that each home good is produced by labor supplied to one and only one home occupation);

and L_k = hours of leisure of the k^{th} family member.

This function is to be maximized subject to a time constraint which says simply that for every member of the household the number of hours spent each day on market work, homework, and leisure must total 24; in short

$$\sum_{\ell} G_{\ell k} + \sum_{j} H_{jk} + L_k = 24$$

for each member of the household.

As Becker [3] then presented, the time and money income constraints, (2.7) and (2.2) respectively, are not independent since time can be converted into income (and thus into market goods) by spending less at home and more at work; therefore, it is possible to express these constraints as one.

$$\Sigma p_i x_i + \Sigma T_i \bar{w} = V + T\bar{w} \quad (2.8)$$

or

$$\Sigma(p_i b_i + t_i \bar{w})Z_i = V + T\bar{w}$$

with $$\pi_i \equiv p_i b_i + t_i \bar{w}. \qquad (2.9)$$

The full price of a unit of Z_i (π_i) is the sum of the prices of the goods and of the time used per unit of Z_i. That is, the full price of consumption is the sum of direct and indirect prices in the same way that the full cost of investing in human capital is the sum of direct and indirect costs. Becker terms this total resource constraint "full income". In these equations, $\bar{w}$ is a vector giving the earnings per unit of T_w (a vector giving the hours spent at work) and b_i is a vector giving the input of market goods per unit of Z_i.

This income could in general be obtained by devoting all the time and other resources of a household to earning income, with no regard for consumption. Of course, all the time would not usually be spent "at" a job: sleep, food, even leisure are required for efficiency, and some time (and other resources) would have to be spent on these activities in order to maximize money income. The amount spent would, however, be determined solely by the effect on income and not by any effect on utility.

Households in richer countries do, however, forfeit money income for a greater amount of psychic income. For example, they might increase their leisure time, take a pleasant job in preference to a better-paying unpleasant one, employ that unpredictable brother-in-law, or eat more than is warranted by considerations of productivity. In these and other situations, the amount of money income forfeited measures the cost of obtaining additional utility.

Thus the full income approach provides a meaningful resource constraint and one firmly based on the fact that goods and time can be combined into a single overall constraint because time can be converted into goods through money income. It also incorporates a unified treatment of all substitutions of non-pecuniary for pecuniary income, regardless of their nature or whether they occur on the job or in the household.

If full income is denoted by S, and if the total earnings forgone or "lost" by the interest in utility is denoted by L, the identity relating L to S and I is simply

$$L\ (Z_1,\ldots,Z_m) \equiv S - I\ (Z_1,\ldots,Z_m) \tag{2.10}$$

I and L are functions of the Z_i because how much is earned or forgone depends upon the consumption set chosen. For example, up to a point, the less leisure chosen the larger the money income and the smaller the amount forgone. Equation (2.10) can be rewritten as

$$\Sigma p_i b_i Z_i + L\ (Z_1, \ldots, Z_m) \equiv S \tag{2.11}$$

This basic resource constraint states that full income is either spent directly on market goods or indirectly through the forgoing of money income.

Becker's analysis results, ultimately, into these equilibrium conditions when the utility function is maximized subject to (2.11):

$$U_i = T(p_i b_i + L_i) \qquad i = 1, \ldots, m \tag{2.12}$$

where $p_i b_i$ is the direct and L_i the indirect component of the total marginal price $p_i b_i + L_i$.

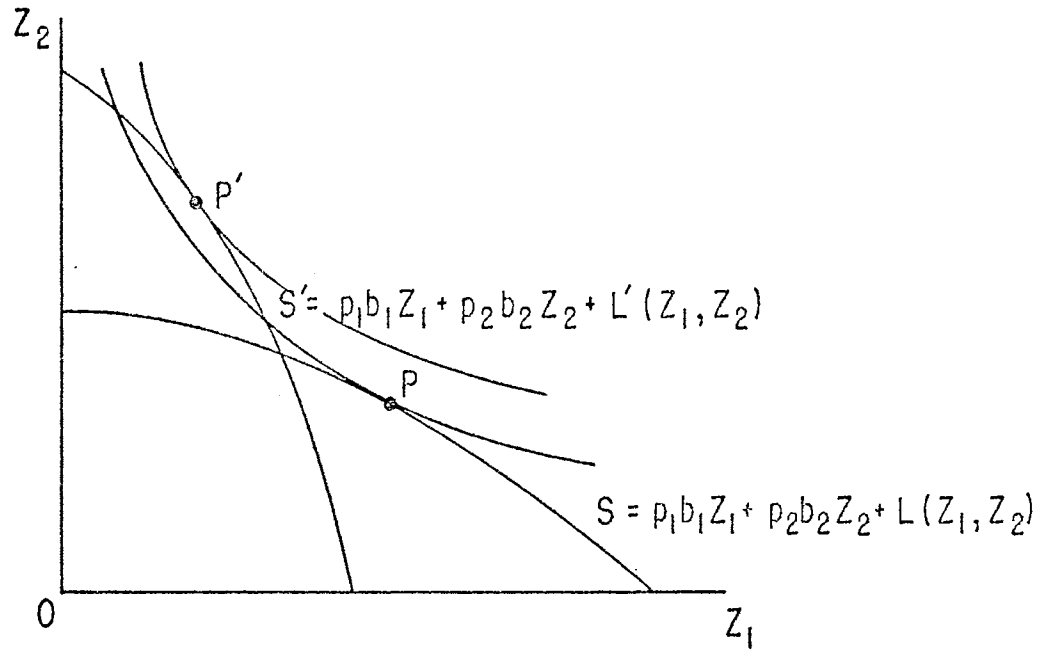
Figure 3, which accompanied Becker's article, shows the equilibrium given by (2.12) for a two-commodity world. In equilibrium the slope of the full income opportunity curve, which equals the ratio of marginal prices, would equal the slope of an indifference curve, which equals the ratio of marginal utilities. Equilibrium occurs at p and p' for the opportunity curves S and S' respectively.

Conclusions Relative to Female Labor Force Participation

The labor-leisure model stood for years as the most sophisticated means of determining the supply curve of labor in the market. With the introduction of the household-as-a-decision-making-unit theory the analysis has perhaps become more complicated but seems to better fit the "real world." All of an individual's time is not equally divided between labor and leisure, as the former model would suggest, but can be seen to encompass a commodity Becker [3] termed "consumption time."

This second type of analysis is probably particularly applicable to the situation of women and their time which can be divided among leisure activities, home production, and market participation. By the determination of the amount of "consumption time" a woman has and what effects changes of various factors - income, earnings, market prices - affecting its determination will have, the effects on hours available for work can be seen.

In addition, because the theory concerns all members of a household, instead of a simple allocation problem of dividing time efficiently among commodities, multi-person households must also allocate the time of different members. Members who are relatively more efficient at



Source: [3, p. 500].

Figure 3. Equilibrium Dictated by Becker's Theory of the Allocation of Time in a Two-Commodity World

market activities would use less of their time at consumption activities than would other members. Moreover, an increase in the relative market efficiency of any member would effect a reallocation of the time of all other members towards consumption activities in order to permit the former to spend more time at market activities. In short, the allocation of the time of any member is greatly influenced by the opportunities open to other members.

If the income of the husband is not quite sufficient to support his family, the member of the household next most efficient at market activities oftentimes is the wife and therefore she will enter the labor force to help make ends meet. This, of course, will decrease the time she can spend at "consumption." With less time at home, the wife must use that time as efficiently as possible to carry out all the tasks she previously had done. ("A woman's work is never done.") This has lead to the increasing importance of convenience goods. A meal that previously took hours of the wife's time to prepare now can be ready in minutes via TV-dinners. Of course, the cost of the meal is now a little more than had it been from scratch, but not enough to convince the wife to stay at home once again and forego the market wage she is earning.

As the market wage increases the wife is willing to supply more and more of her time in the market placing more and more consumption duties on other family members. At some point, though, the income effect dominates the substitution effect - the backward-bending segment of the supply curve of labor is reached - and some income is forgone so that more "leisure" (actual leisure or time to be spent in the production of home goods) can be had.

Numerous factors affect a woman's decision concerning labor force participation and the hours she is willing to supply in the labor market, if she decides in favor of participation. The next chapter is a brief summary of recent studies concerned with these decisions and any conclusions reached by their authors. The theory supplied above is a basis for the inclusion of many of the factors in each analysis. This study will be no exception.

CHAPTER III

PREVIOUS STUDIES ON FACTORS INFLUENCING FEMALE LABOR FORCE PARTICIPATION

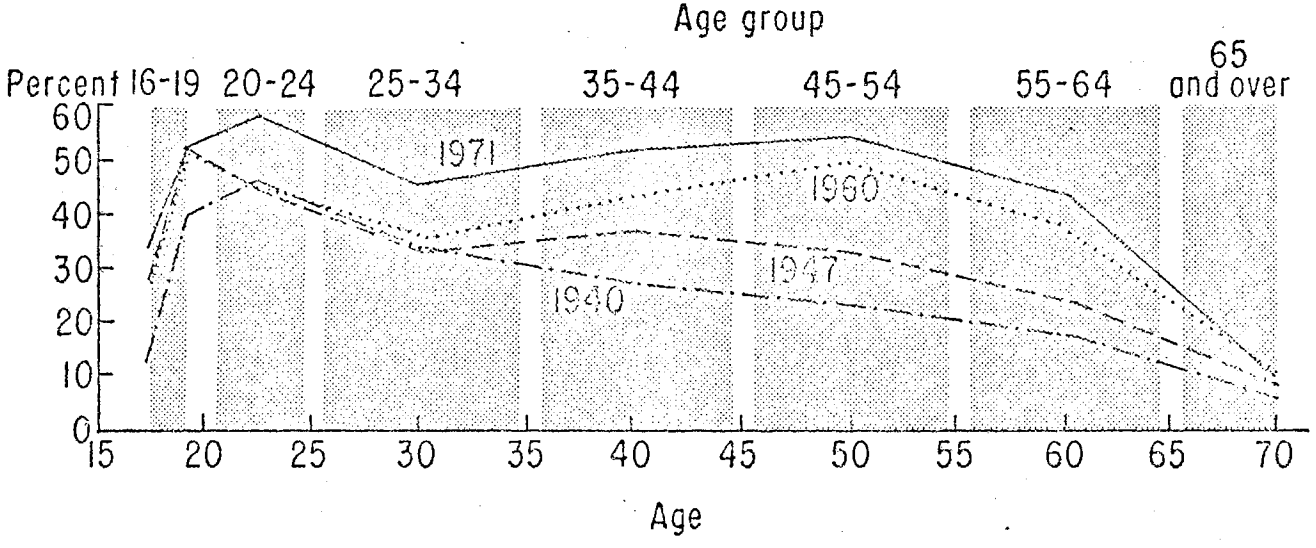
Many studies of the labor force have been undertaken in the recent past. These studies usually divided the population by sex, race, and age groups and oftentimes by head-of-household/not-head-of-household type distinctions. In an effort to present the results of these separate analyses in an organized manner, the variables were grouped together which tended to influence various aspects of the woman's decision by types, that is, personal characteristics, family structure, residence, work experience, attitudes, income, and education.

Personal Characteristics

Age

Through the years the labor force participation rates of women by age have changed dramatically. Up to and including 1940 the rates increased steadily through ages 20 to 24 and then declined continuously. Since then this curve has developed an M-shape with the second peak occurring during the ages 45 to 54. See Figure 4.

In Thomas A. Mahoney's 1961 study of the St. Paul, Minnesota, labor market [22] he employed age as an explanatory factor and saw it as a critical dimension of the family cycle and, as such, contributing



Source: [33, p. 65].

Figure 4. Labor Force Participation Rates by Age Group for Women, 1940-71

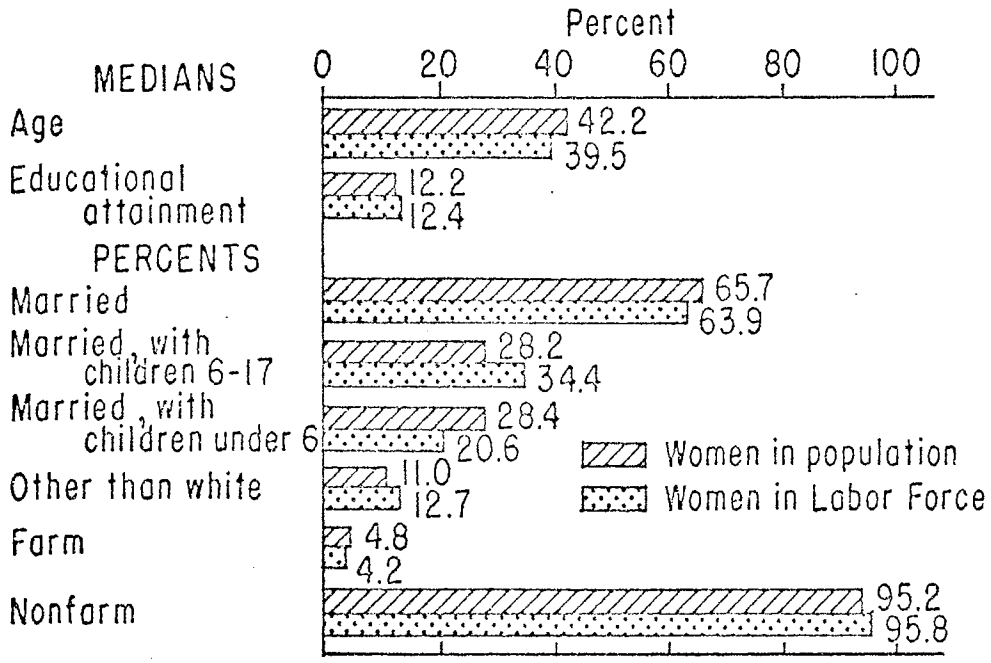
much to the explanation of the variance in his regression. Gertrude Bancroft [1] concluded from her 1958 study of the American labor force that the increasing propensity of women past 35 years of age to be in the labor force more than compensated for the losses that would have taken place because of the increased responsibilities of younger women. Several of the studies, in an effort to control for this variable, divided the women into various age groupings. This resulted in the changing importance of the other variables employed in the analysis from one age group to another.

James N. Morgan, Ismail Sirageldin, and Nancy Baerwaldt [26] found age to be one of the three most powerful explanatory variables for the labor force participation of wives. Age, education, and husband's income, they stated, were so powerful that they must be allowed for before one can search for the effects of other factors without the danger of spurious correlations.

Race

The race of the woman has always been significant in the statistics of labor force participation of women. The percentage of nonwhites in the labor force is slightly above the percentage in the population. See Figure 5. The need for income surely accounts in a large part for the higher work rates of nonwhite women even when childcare responsibilities at home might well dictate a different preference.

In the Morgan, Sirageldin, and Baerwaldt study [26] race was one of the factors that, after age, education, and husband's income had been taken care of, "had the expected effect on whether the wife worked, but did not affect enough people strongly enough to matter." This may



Source: [18, p. 83].

Figure 5. Characteristics of Women in the Population and in the Civilian Labor Force, 1969

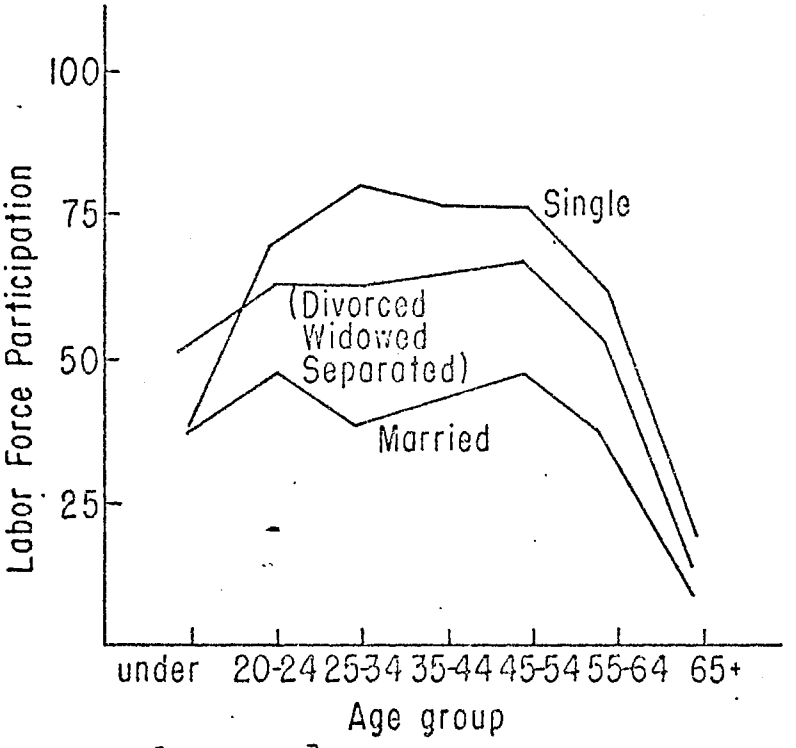
be logical since the nonwhite population has a generally lower educational level and income level than the white populations, and once these differences are accounted for, it would seem that other factors would influence each group in very nearly the same ways.

Marital Status

The study by Bowen and Finegan [5] in 1969 went into the most detail concerning the separate divisions of marital status. Their analysis of women was divided between married women, spouse present, and single women, 15 to 54. Included in the division of single women were the never-married, widowed, divorced, and separated. In this category the major differences arose between the never-married classification and all others, the never-married tending to have a higher adjusted participation rate. They also found that the participation rates of single women tend to be considerably less sensitive to labor market conditions than those of married women.

> Many single women have no real alternative to participation in the labor force, either in terms of other services of money income or in terms of an implicit 'home wage', and therefore there should be a smaller (relative) number of single women whose participation decisions are influenced by any given change in labor market conditions [5, p. 267]. See Figure 6.

Clarence D. Long's analysis [21] compared the labor force tendency of wives to that of all females and found that although the participation of wives does not depend on size of city, density of rural population, or education attainment (below college level), the participation and employment of all females seems closely related to the extent of their education - more closely, indeed, than to their age. The Morgan, Sirageldin, and Baerwaldt study [26] determined that sex and marital



Source: [18, p. 32].

Figure 6. Labor Force Participation Rates of Women by Age and Marital Status, 1969

status of the head of the family combined with several other variables (whether the family owns a business or farm, hourly earnings of the head of the family, and a combined index of the individual's concern with progress) explained a significant portion (12.5%) of the variance.

Health

The general consensus of the studies is that the disabled woman is less likely to be working or working less than full-time. This is a logical conclusion.

After accounting for age, education, and husband's income, Morgan, Sirageldin, and Baerwaldt [26] employed disability and illness of the wife and disability of the husband in an attempt to explain the variance further. But they were found to be among the variables not strongly affecting enough people to matter.

In essence, then, the health of other family members plays a dubious role in the determination of labor force participation of a woman. Some may see the severe illness or disability of a family member as a cause to stay away from the labor market to act as a nurse to that person. Others will view the same circumstances as sufficient motivation (especially in the case of the disability of the head of the household) to enter the market. But neither plays a dominant role.

Family Structure

Children-Family Size

Most studies set up two major groupings for the ages of children: children under 6 and children 6 and older. Six is chosen as the

breaking point since it is the age when most children start school or at least begin going for full days. Up until that time, the mother usually considers herself obligated to staying at home to care for the children, unless "adequate" childcare facilities are available. After the youngest child has attained this age, the mother is free to enter the labor market, on a part-time basis at least.

Long [21] concluded in his analysis that mothers of young children have much lower participation rates than wives without young children, and since women tend to have their children when they are younger the home responsibilities of the younger women tend to be greater than those of older women whose children are in school or able to fend for themselves. Long also adds that, with or without young children, the more prosperous the husband, the less likely that the wife is to be in the labor force. Bancroft [1] states that data available at the time of her study suggest that a married woman's decision to enter the labor force is influenced more by whether or not she has young children than it is by the amount of her husband's income or by his occupation. These statements of findings are in direct conflict with each other since it seems that the "prosperity" of the husband and his income would be positively correlated.

Mahoney [22] found the size of family to be inversely related to participation in the younger age range of women in his study and positively related to participation in the older age groups. The interaction of family size, presence of children, and past employment experience in this study brought about some interesting results. Mahoney found past employment experience to be the variable most predictive power of the remaining variables; e.g., the presence of children

under six years of age is found to be a lesser deterrent to the participation in the 30 to 39 age range of women. Given the previous labor force experience, the presence of small children carries less weight than size of family and personal attitudes toward married women working. The presence of small children becomes the single most predictive variable, however, when employment experience is eliminated, indicating a relatively greater importance in the original employment decisions.

Once again Morgan, Sirageldin, and Baerwaldt [26] see the presence of preschool children as being of little import once their "big three" (age, education, and husband's income) have been accounted for. Their analysis used two measures in incorporating this type of variable in the analysis: children by age groupings and by the number of children living at home, but the effect did not affect enough people strongly enough to be of import.

Bowen and Finegan [5] listed the increase in the proportion of married women having pre-school children as one of the forces acting to push down participation rates over the period under study, 1948-1965. This increase, according to the authors, more than offset the effects of the rural-urban migration.

Head of Household

This group of females is made up of those who are supporting themselves. Thus, it would be expected that a larger proportion of these women would be in the labor force. Morgan, Sirageldin, and Baerwaldt [26] found that marital status of the head of the household figured prominently in the decision of labor force participation.

James N. Morgan, Martin H. David, Wilbur J. Cohen, and Harvey E. Brazer [25] found that plans requiring future income also had some significant relation.

Residence

Place of Residence

In a study completed in 1956, Otis Dudley Duncan and Albert J. Reiss, Jr. [10] set about classifying the counties of the United States as either metropolitan (inside standard metropolitan areas as delineated in 1950) or nonmetropolitan. Metropolitan counties were then subclassified according to the size of the central urbanized area of the SMA,[1] with one group comprising those SMA's containing an urbanized area of 250,000 inhabitants or more, and the other group all remaining metropolitan counties. The nonmetropolitan counties were subclassified by size of the largest city in the county, into those containing an urban place of 25,000 or more, and those with no place as large as 25,000. The results showed that there was very little relation between the labor force participation of rural-nonfarm females and type of county. It was found, though, that the labor force participation rates of rural farm females differ substantially among the type-of-county groups. The rate went down steadily from 20 percent of the metropolitan counties with large centers to 15 percent for the least urban counties.

In Productive Americans, Morgan et al. [26] determined that wives living in standard metropolitan areas of 50,000 or more were about 10 percent more likely to work because such places offer more opportunities

for women's employment. Once again, though, "size of place" was among the variables that had the "expected effects on whether the wife worked" but was not used because it "did not affect enough people strongly enough to matter" - after the effects of age, education, and husband's income had been taken into account.

Distance to Job Opportunities

The effects on the labor market of the proximity to urban industrial concentrations are several. The opportunity for nonfarm employment provides an option other than agriculture for farm youth entering the labor market. It also provides an opportunity for persons working in agriculture to shift to part - or full-time nonfarm occupations. Such shifts may occur through migration or by long-distance commuting, of course, but in such cases the potential income gains are partially offset by the cost of relocating or commuting. Thus assuming that all of the profitable shifts actually occur, we would expect to find higher incomes in rural areas adjacent to urban industrial areas due to the lower transfer costs involved in changing occupations. Also, information regarding nonfarm employment opportunities would be better in rural areas adjacent to urban industrial concentrations than in areas further removed from employment opportunities.

The underlying hypothesis of Dale E. Hathaway's People of Rural America [14] was that the location of rural areas with respect to a large metropolitan area is crucial in determining the character of these rural areas. As a measure of the "degree of rurality" he used three separate measures of the proximity of a county to an urban area: (1) distance of a county from the nearest SMSA (standard metropolitan

statistical area), (2) and (3) two size-distance measures of rurality differing only in the assumption as to the maximum distance that an SMSA of 2 million extends its influence (one assumes that the maximum area of influence was 500 miles, the other, 200 miles). These measures had at least one thing in common, they all used SMSA's as reference points (i.e., they assumed that unless an urban industrial concentration had at least 50,000 population it would be too small to influence the surrounding area in major ways).

The results of his analysis for females were that, in general, the frequency of employment of white females - regardless of residence - as operatives in durable manufacturing was positively related to proximity to an SMSA. The frequency of nonfarm white females employment as service workers was negatively related to distance from an SMSA. Unlike the situation for white males, the frequency of employment in different occupations for rural-farm females was less often related to the distance and size-distance variables than for nonfarm residents. In fact, for both white and nonwhite rural-farm females there was less relationship between occupational distribution and the proximity to urban areas than for any other residence group.

The occupational distribution of female employment appeared generally less related to proximity to urban areas than was the case for males. Moreover, despite their more frequent employment in agriculture in 1960, the occupational pattern of employed rural-farm females was less related to the proximity to urban areas than was that of their urban and rural-nonfarm counterparts. In general, over the period 1940 to 1960 the pattern of industry of employment of rural-farm females became more like that of urban and rural-nonfarm females. The largest

remaining differences in 1960 were the much higher proportion of rural-farm females employed in agriculture and the substantially lower proportion employed in manufacturing and in the wholesale and retail trades. As in the case of occupational distribution, employment patterns by industry showed fewer differences between rural and urban females than were found between their male counterparts.

Wallace E. Huffman [16] constructed a different index to measure the effects of distance to jobs. It was set up as the average number of persons employed in retail trades, manufacturing, and local governments per farm in each of 276 counties of Iowa, North Carolina, and Oklahoma - the states used in his analysis because of the continuing importance of agriculture in each. It was surprisingly strong in the regression analysis of off-farm work of the wives of farm operators. The positive coefficient indicated that the "closer" the farm to nonfarm jobs, the larger the number of days of nonfarm work, suggesting that commuting cost (both direct outlays and the value of time spent commuting) were an important determinant of the supply of nonfarm work of wives of farmers. Huffman also stated that his distance variable could also be interpreted as a measure of the information about of the "availability" of nonfarm jobs. Hence, increasing the information about or the availability of jobs increases the number of days of off-farm work [16, p. 22].

Work Experience

Only Mahoney [22] considered the inclusion of a variable measuring past work experience and retained it as significant to the analysis.

For his division of those married women under 30, he found that no single variable dominated in the final model but that family income and past labor force experience were positively related to current participation. When the effects of past employment experience were removed by the regression model the relative predictive power of each of the remaining variables, particularly size of family, was increased.

For those over 29, on the other hand, he found past employment experience to be the most predictive of labor force participation. Removing this variable tended to shift the relative predicative power of the remaining variables with the result that the presence of small children became the single most predictive variable.

Attitudes

Woman's

Attitudes tend to be greatly influenced by the events of the times. Bancroft [1] in 1958 saw the increasing employment of married women as universal, in all types of markets, and, therefore, viewed it as reflecting the widespread changes in customs and attitudes brought about by the manpower shortages during World War II. More recently the advent of the women's liberation movement has caused a growing awareness among all women of the numerous alternatives available to them outside the traditionally female occupations: housewife, school teacher, nurse, secretary, and so on.

Mahoney [22] found for the age range of women over 29 that past employment experience was the most predictive variable in determining

labor force experience. Given this past experience, however, he found that the variables of size of family and the woman's personal attitudes toward married women working were more heavily involved in the labor force participation decision.

Husband's

The attitudes of the husband are just as susceptible to societal influences as those of his wife. As it has come to be viewed as socially acceptable to have a wife in the labor force more and more men are changing their views. Several years ago letting his wife go to work would have implied that the man simply could not totally support his family. Today he can at least imply that he is letting her work for her own personal satisfaction - the fact that her income augments the family income is still there, but is probably chosen to be ignored by the husband.

The studies that employed this type of variable are few. Morgan, David, Cohen, and Brazer [25] concluded from their analysis of wives labor force participation that younger women, women with no children, nonwhite women whose husbands favor wives working, and women with no disabilities were more likely to be working. Morgan, Sirageldin, and Baerwaldt [26] stated:

> In summary, when a wife has children at home and a husband who does not approve of mothers' working, she is usually discouraged from working beyond what one would expect from her age and education and her husband's income, already accounted for [26, p. 58].

Income

Woman's

The income of the woman as such could be found nowhere in the studies as an influencing factor in the labor force participation decision. Instead it took the form of "plans requiring future income" and "rising income aspirations."

Morgan, David, Cohen, and Brazer [25] in their analysis of the head of the family found that plans requiring future income - taking care of parents after their retirement, sending children to college - had a significant relationship with the head's labor force participation. Bowen and Finegan [5] included rising income aspiration in their list of forces tending to push up the participation rates of married women, in the period 1948-1965. This would perhaps imply the purpose of the wife's working is to augment the family's income to allow a higher standard of living to be attained.

It had been hypothesized in several of the studies concerned with long periods of time that the increase in the size of the female labor force has been due to the rising ratio of female to male earnings. Long [21] delved into this but found that, at least in the decades previous to his study, his data on labor force and earnings did not lend any support to this contention.

Husband's

If a general consensus is drawn from recent literature, husband's income plays a very significant role in the labor force participation decision of the married woman; i.e., as the income of the husband

increases it becomes less likely that his wife is in the labor force. Her income becomes less important since it is augmenting an increasingly larger amount and she chooses, more and more, leisure above work.

Bancroft [1] found that, in general, a married woman is more likely to be in the labor force if her husband's income is low, but her likelihood of being a full-time worker in any given week does not seem to depend directly on his income. Long [21] determined that, with or without young children, the more prosperous the husband, the less likely that the wife was in the labor force.

Husband's income was found to be one of the three very powerful explanatory factors (age and education were the other two) in the analysis of working wives undertaken by Morgan, Sirageldin, and Baerwaldt [26]. Once these three were allowed for the other predictors could be tried in the analysis. The authors failed to use any of the others because they "did not affect enough people strongly enough to matter" although they did have the expected effects on whether the wife worked.

Family Income

Mahoney's [22] analysis of the St. Paul labor market employed family income as a possible explanatory variable. For the group of married women under 30 years of age, while no single variable dominated, family income was positively related to their labor force participation. Family income was not particularly predictive of participation in the over 30 age group, but he found that factors other than family income became much more predictive after age 29. This alone remained of the several economic variables he originally included despite the frequent

suggestion that economic pressure is a major factor in explaining employment patterns of married women.

Morgan, David, Cohen, and Brazer [25] in the summary of their analysis of wives labor force participation concluded that women whose families had low income from sources other than the wives' earnings were more likely to be in the labor force. This measure would include the major component in family income - the husband's. Once again, if this is low, it is more likely that the wife will be in the labor force.

Education

Woman's

Long [21] identified the dramatic increase in education of the average woman as one of a few dynamic forces that were capable of explaining important elements of labor force behavior in the period of his study. This increase, both absolute and relative to that of older men, in conjunction with the growing need for clerical and service labor, probably gave women a comparative advantage over the less well-trained and frequently overpaid older workers and the untrained child; and it may have accounted for the ability of the market to absorb the increased supply of women.

Education was one of the "major" explanatory variables in Morgan, Sirageldin, and Baerwaldt's analysis [26] of the labor force behavior of wives. Bowen and Finegan [5] cited the rise in the educational attainment of women during the period 1948-1965 as one of the forces acting to push up the participation rates of married women. Glen G. Cain's study [6] pointed to education as having a positive effect on

the labor force participation of wives. According to Long [19], although the labor force tendency of wives did not depend on size of city, density of rural population, or educational attainment (below college level), the participation and employment of all females seemed closely related to the extent of their education - more closely, indeed, than to their age. Huffman [16] found that the coefficient on the wife's education variable was positive and significant, indicating that an increase in educational attainment brought about a net effect of a reduction in her consumption time and hence an increase in the supply of nonfarm working time.

Educational level is, thus, a very active variable in the labor force participation decision of women. It was employed in most of the recent literature on this subject with significant results.

Difference Between Husband's and Wife's Levels of Education

The study by Morgan, David, Cohen, and Brazer [25] used the difference in the educational levels of the husband and wife as an explanatory variable. They saw it as representing a possible disparity between the standards of living desired by the wife and the husband's ability to meet them.

> When the wife has more education than the head, she may expect, and exert pressure for, a higher standard of living than the husband can provide ...Several sociological studies have found the wife's education more highly correlated with level of living than the husband's education [25, p. 37].

Since the wife's educational level is highly correlated with her husband's, the use of the difference between the two, rather than the

absolute levels, avoids statistical difficulties that would arise from intercorrelations among the explanatory factors.

This disparity, then, is likely to prompt the wife into entering the labor force to attain the items she feels are necessary to fill the gap. It remains to be seen if this difference in educational levels explains more of the variance than the education of the wife taken by itself.

Conclusions

In general, the rise of female participation, while it varied widely according to age, marital status, and period studied, was nevertheless characteristic of both young and old, married and single, and of recent as well as of earlier years. The female labor force, in fact, was viewed by Valerie Oppenheimer [27] as "supertypical of the general trends exhibited by male workers," in spite of some important differences in the detailed industrial distributions of men and women in the three major industrial groups. Indeed, the tendencies observed for both sexes seem to have started earlier for women and been more pronounced for them in several cases.

This rise in the participation rates of women has been the subject of many recent studies, all undertaken in an effort to determine the factors causing such a rise. Oppenheimer [27] suggested that perhaps the best explanation for the overall increase in female labor force participation in recent years was that there has been an increase in the demand for female workers which has, in turn, stimulated an increase in the supply of women in the labor market. This rising demand

could to a large extent be attributed to a rise in the demand for workers in typically female occupations - clerical work and several occupations in the professional and service categories.

Bowen and Finegan [5] summarized the forces acting upon female participation rates in the period of their study, 1948 to 1965. Those exerting a negative pressure were:

1. an increase in the proportion of married women having preschool children (which, they stated, had more than offset the effects of the rural-urban migration),
2. a somewhat higher overall unemployment rate at the end of the period than at the beginning,
3. an increased ability to afford leisure made possible by the increase in the level of real income, and
4. increases in the costs of domestic service.

The forces pushing up participation rates were:

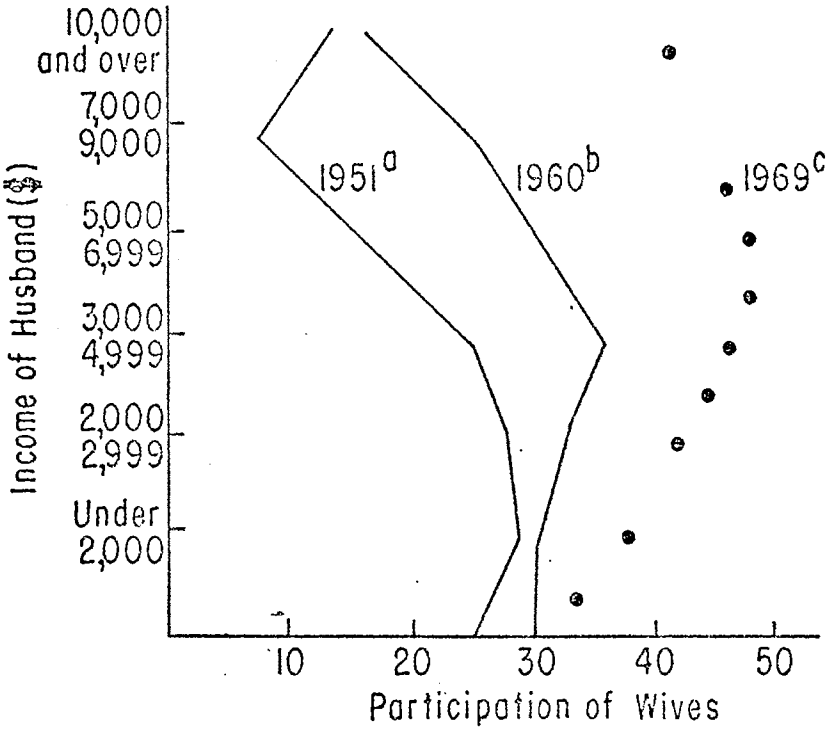
1. a general increase in female wage rates,
2. a rise in the educational attainment of women,
3. an increase in the femininity of industry mix,
4. a decline in the average hours worked per week and a concomitant increase in the availability of part-time jobs,
5. changes in the methods of producing home goods which have served to encourage the wife to seek work in the market, and
6. rising income aspirations.

Today there are relatively small differences between the percentage of women in various categories of the population and those in the labor force. It is clearly no longer possible to distinguish the working woman as one who is married or unmarried, young or old, black or white, or even as one with or without young children. The working pattern is an all-pervasive one.

There is a definite tendency for more women from all categories to be working. The participation rates and worklife pattern of single women, and those of women who are widowed, divorced or separated, observe patterns that are quite different from those of married women, however. Changes in the rates in the past three decades have been much more pronounced for married women, particularly older married women. The key questions related to the growth in the supply of womanpower therefore have to do with the factors accounting for the increased labor force activity of married women. The most important variables - the woman's age and education, and her husband's income - seem to account for most of the variation in her willingness to work.

Looking with particular interest at husbands' income as a dominating factor, Jacob Mincer [24] showed that while husbands' earnings have been rising, wives' earning potentials have been rising also. The positive correlation of the wives' desire to work with their own potential earnings more than offset the negative impact of their husbands' higher incomes, with the result that increasing proportions of wives joined the labor force each year. Cain [6] found that at all income levels of husbands, larger percentages of wives worked in 1960 than in 1951, but the biggest increase occurred among those wives whose husbands were in the $3,000 to $10,000 range, and particularly the $7,000 to $10,000 bracket. See Figure 7.

This study sets out to verify the relative importance of the factors summarized in the previous sections of this chapter for a subgroup of the female population of the United States. It goes beyond the studies reviewed in that it determines the influence these factors have upon the probability of the woman being in the labor force. Indeed,



a = All wives, aged 14 and over
b = Wives aged 20-24
c = All wives, aged 14 and over

Source: [18, p. 22].

Figure 7. Labor Force Participation of Wives 1951, 1960, 1969 by Income of Husband

special interest is placed upon the place of residence of the woman and its explanatory power in the determination of her labor force decision. Another major concern of this study is the relative importance of the factors in the determination of a supply function of hours worked outside the home by the women surveyed. Indeed, only one of the many studies reviewed concerned itself with this type of objective.

FOOTNOTES

[1]Subsequently redefined as Standard Metropolitan Statistical Area (SMSA).

CHAPTER IV

THE WORK EXPERIENCE SURVEY WITH A DESCRIPTIVE ANALYSIS OF THE DATA

Description of the Survey

Source

The data are the results of the National Longitudinal Surveys being conducted by The Ohio State University's Center for Human Resource Research (in collaboration with the U.S. Bureau of the Census) under contract with the Manpower Administration of the U.S. Department of Labor.[1] The study is directed by Professor Herbert S. Parnes of the Center. The focus of the study is the interaction among economic, sociological, and psychological variables that permit some members of a given age-education-occupation group to have satisfactory work experience while others do not. The study follows for 5 years the labor market experience and work attitudes of four groups of 5,000 people each - men 45-59 years old, women 30-44 years old, and young men and young women 14-24 years old. These are the ages at the time of the initial surveys - 1966 for the two groups of men, 1967 for the older women, and 1968 for the young women.

Each individual in a sample is being interviewed periodically over the course of 5 years in order to record complete work histories as well as to record changes in those characteristics that are

hypothesized to be related to labor market behavior - for example, health, family structure, education, training, and so on. In addition, the initial survey in each case provides a considerable amount of background material for each respondent, including an abbreviated history of work activity since leaving school.

While the general purpose of all four studies is to explain individuals' labor market behavior and experience, specific research objectives vary among them. For the group of older women, that chosen for my study, the major concern is the problem of reentry to the labor market after the children are grown or in school. Whether this is viewed as a second work career or merely a continuation of the first, it is important from a policy point of view to be aware of the problems of readjustment that frequently are encountered. Moreover, irrespective of departure from and reentrance to the labor market, the fact that most married women have careers as homemakers in addition to whatever roles they may play in the labor market means that their labor market decisions are likely to reflect more complex sets of forces than those of men.

Sampling Procedure

For each of the four groups, a probability sample of the non-institutional civilian population was drawn by the United States Census Bureau from 235 primary sampling units in the experimental Monthly Labor Survey (MLS). This research sample was put into operation by the Bureau of Labor Statistics in April, 1964.

The MLS is an area probability sample of the United States, including every state and the District of Columbia. The initial sample for

MLS was comprised of 8,750 households per month located in 105 sample areas. In the summer of 1965, the MLS sample size was increased to 17,500 households per month, distributed among 197 areas. In each month, interviews of the households are conducted in the week containing the nineteenth day of the month; the interviews tested various forms of questions relating to employment status during the preceding calendar week, the week containing the twelfth of the month. This experimental survey was used to test a number of changes in the interview schedule for the Current Population Survey (CPS) that had been proposed as a means of refining and improving current measures of the labor force, employment, and unemployment. After two and one-half years of experimentation and pretesting, in January, 1967, the CPS was amended and its sample merged with the MLS, enlarging the CPS sample to 52,500 households in 449 areas.

The data used for this study are of about 5,000 individuals in each of the four age-sex groups. To permit statistically reliable estimates for blacks, a sampling ratio four times as great as that for whites has been used so that each sample consists of approximately 3,500 whites and 1,500 blacks.

A Longitudinal Study

A longitudinal population study has two essential characteristics. First, it involves measurement or description of one or more characteristics of the same group of individuals at two or more points in time. Second, it involves analysis of relationships among the characteristics of these individuals at different times or of changes in one or more of their characteristics over time. It should be noted that

whether a study is longitudinal is independent of whether data are collected periodically. Making an annual survey of a group of individuals does not in itself assure a longitudinal study; nor is such a study precluded by the fact that only a single survey is conducted. If work experience data are collected annually from a sample of individuals over a five-year period solely for the purpose of ascertaining the total amount of unemployment or the total number of job changes experienced during the period by the respondents, the study is clearly not longitudinal in terms of the definition offered above. On the other hand, if a single survey collects five-year work histories and if analysis of the data includes comparisons between the labor force status of the respondents in year n and their employment status in subsequent years, or between unemployment experience in year n and job mobility in year n-1, the study is longitudinal even though it does not involve repeated surveys.

Although a longitudinal analysis covering a five-year period may thus be made on the basis of a single survey at the end of the period, there are three major advantages in the plan undertaken for this survey. First, some types of variables cannot conceivably be measured retrospectively. If a characteristic that is subject to change over time can be ascertained only by an objective measurement (or subjective judgment) made by someone other than the respondent, retrospective measurement of that variable is obviously ruled out. Many attitudinal measures (e.g., "How do you feel about your job?") fall into this category.

A second advantage of periodic surveys is that even in the case of information that from a purely logical standpoint could be collected retrospectively, validity of the data is frequently impaired by the

respondent's faulty recall. The shorter the time period covered by detailed work histories, the more accurate are the responses likely to be, since respondents are likely to forget jobs of short duration or short periods of unemployment when they are queried about work experience over a long period of time. Data on annual income are another case in point. These considerations suggest that even if longitudinal analysis were not contemplated (that is, if the study proposed merely to analyze cumulative labor market experience over a five-year period) there would be distinct advantages in collecting the data periodically.

Finally, periodic surveys permit the study of certain methodological problems in labor market research that could not be approached by a single survey. The reliability of response to questions about work experience can be tested by questions asked in the final survey that can be checked against responses in previous surveys. As another example, the validity of hypothetical questions of attitudinal measures as predictors of actual labor market behavior can be tested only through periodic surveys of the same individuals.

At the time of this study data were available for the years 1967 through 1969; data for 1967 and 1969 were obtained by personal interview of each respondent while that for 1968 were gathered from mailed questionnaires. The analysis of this study concerns itself with the data from 1967 only for the following reasons: (1) this study is to be the first part of a continuing study on labor force participation; and (2) the time period covered by the available data is too short to exhibit any significant changes in a respondent's work experience and the factors which affect her participation in the labor force - age, family status, and attitudes, for example.

The Survey Itself

As indicated above the survey's main concern is with the labor market experience of the group in question; here that group is the women 30 to 44 years old. Several measures of a respondent's labor force participation are used in the survey. One of these is based upon the conventional definition of labor force status, which depends on the individual's activity in the calendar week preceding the time of the interview. If the individual is at work during that week or actively seeking work, she will be classified as "in the labor force"; all others are classified as "not in the labor force". A second measure is the total number of weeks in the labor force in the calendar year 1966. While this measure has the advantage of displaying more variation than does labor force status in a single week, it is not based upon as refined a set of measurements as current labor force status, because no careful probes are made to assess the individual's precise activity in each week of the year. A third measure of participation is the number of hours the respondent usually works per week on the primary job, which is frequently used to distinguish full-time from part-time labor force activity. Finally, there is a measure of past labor force attachment - years worked as a percent of potential labor force exposure. This measure is calculated for the period since the respondent ceased attending school full-time by taking the number of years in which she worked at least six months as a proportion of the total number of years in that period.

Recent literature on female labor force participation indicates that there are many variables that influence a woman's decision to

enter the labor force. In general the survey included a large number of the important ones: age, race, marital status, number of children and their ages, educational attainment, formal training outside of school, a self-rating of health, current wage rate, respondent's income, other family income, attitudinal variables of both the respondent and her husband (if married), place of residence, and land usage. There were limitations in the measurement instruments for some of the characteristics, however. In some cases, there were considerations of cost or feasibility that prevented obtaining the kind and amount of information the surveyors would have liked. For example:

> Our original hope was to obtain detailed and specific information on the respondents health status. In reviewing the experience in other surveys, it became apparent that to obtain confident and detailed descriptions of health status would require an inordinately long sequence of questions. As a result, we settle for a brief series of questions in which the respondent was asked to rate her health and physical condition, to indicate to what extent and for how long health problems imposed constraints on her activity, and to describe briefly the nature of the limitation [31, p. 11].

The analysis to follow makes use of many of the variables suggested by the survey but many more topics are covered which do not pertain to this study. For a more detailed discussion, see Dual Careers, Volumes I and II ([31] and [32]).

Descriptive Analysis of the Survey Data

Initial examination of the data involved making counts of the responses to questions stratified by certain economic, social and place of residence characteristics. These counts were of special interest since the major concerns of this study are the woman's status in the

labor force and her place of residence. This section and the Appendix summarize the results of these counts in tabular form.

A first count was made to determine the number of respondents who were in the labor force during the 1967 survey week. See Table II. Unadjusted labor force participation rates for the women, by race, were calculated, and weighted by the total female population in each race.

One thousand seven hundred and twenty of the white women surveyed were "in the labor force" during the survey week in 1967. This means that they were actually working or actively seeking employment during the week in question. Of the nonwhites[2] 949 were classified "in the labor force." Comparing the percentages in the sample, 47.72 percent of the white women were in the labor force versus 64.30 percent of the nonwhites. On a percentage basis, there were more nonwhites than whites in the labor force.

Examining the respondents' labor force participation by marital status and place of residence resulted in the expected finding that the unadjusted labor force participation rates of single women and those that were divorced, separated, married but spouse absent, or widowed were higher than the rates for women who were married and their husbands were present. Tables III and IV summarize this information for the whites and nonwhites,[3] respectively. The survey results may then be compared to 1970 census data for women in the same age range by urban-rural classifications. See Tables V and VI.

The survey asked each woman to indicate how her husband, if she were married, felt or would feel about her working. Would he like it, not care either way, or dislike it? Table VII summarizes the results

TABLE II

UNADJUSTED LABOR FORCE PARTICIPATION RATES,
BY RACE, OF THE WOMEN SURVEYED

WOMEN BY RACE	FEMALE POPULATION 1967[a]	PERCENT OF FEMALE POPULATION	NUMBER IN SAMPLE	PERCENT OF SAMPLE POPULATION	UNADJUSTED LABOR FORCE PARTICIPATION RATES (%)
WHITE	88,793,000	87.77	3,604	70.94	47.72
NONWHITE	12,376,000	12.23	1,476	29.06	64.30
TOTAL	101,169,000	100.00	5,080	100.00	49.73[b]

[a] Source: Statistical Abstract of the United States: 1968 (89th edition) Washington, D. C., 1958.

[b] Weighted by the total population in each race.

TABLE III

UNADJUSTED LABOR FORCE PARTICIPATION RATES, BY MARITAL STATUS AND RESIDENCE, FOR WHITE WOMEN SURVEYED, 1967

MARITAL STATUS		SMSA		NONSMSA		TOTAL
		Farm	Nonfarm	Farm	Nonfarm	
	Number in Sample	33	1860	193	1,024	3,110
MARRIED	% of Sample Population	.64	36.62	3.80	20.16	61.23
SPOUSE PRESENT	Unadjusted Participation Rate (%)	54.54	41.88	45.08	45.60	43.44
	Number in Sample	0	138	4	32	174
NEVER-MARRIED	% of Sample Population	.00	2.72	.08	.63	3.42
	Unadjusted Participation Rate (%)	.00	89.86	50.00	75.00	86.21
	Number in Sample	0	218	8	94	320
OTHER	% of Sample Population	.00	4.29	.15	1.85	6.30
	Unadjusted Participation Rate (%)	.00	72.48	50.00	60.64	68.44
TOTAL	Number in Sample	33	2,216	205	1,150	3,604
	% of Sample Population	.64	43.63	4.04	22.64	70.96
	Unadjusted Participation Rate (%)	54.54	47.88	45.36	47.65	47.72

TABLE IV

UNADJUSTED LABOR FORCE PARTICIPATION RATES, BY MARITAL STATUS AND RESIDENCE, FOR NONWHITE WOMEN SURVEYED, 1967

MARITAL STATUS		SMSA		NONSMSA		TOTAL
		Farm	Nonfarm	Farm	Nonfarm	
	Number in Sample	8	652	49	243	952
MARRIED	% of Sample Population	.15	12.84	.96	4.78	18.74
SPOUSE PRESENT	Unadjusted Participation Rate (%)	25.00	61.81	57.14	62.96	58.40
	Number in Sample	1	75	8	31	115
NEVER MARRIED	% of Sample Population	.02	1.48	.15	.61	2.26
	Unadjusted Participation Rate (%)	.00	57.33	75.00	74.19	62.61
	Number in Sample	1	292	11	104	408
OTHER	% of Sample Population	.02	5.57	.22	2.05	8.03
	Unadjusted Participation Rate (%)	.00	67.46	54.54	83.65	71.08
	Number in Sample	10	1,019	68	378	1,475
TOTAL	% of Sample Population	.20	20.06	1.34	7.44	29.04
	Unadjusted Participation Rate (%)	30.00	63.10	58.82	69.31	64.30

TABLE V

UNADJUSTED LABOR FORCE PARTICIPATION RATES, BY MARITAL STATUS AND RESIDENCE, FOR WHITE WOMEN 30 TO 44, 1970

MARITAL STATUS		URBAN	RURAL		TOTAL
			Nonfarm	Farm	
MARRIED SPOUSE PRESENT	Number in Population	8,747,415	3,135,598	585,850	12,468,863
	% of Population	6.20	2.22	.42	8.84
	Unadjusted Participation Rate (%)	41.99	43.74	34.80	42.09
NEVER-MARRIED	Number in Population	681,719	137,578	25,667	884,964
	% of Population	.48	.10	.02	1.10
	Unadjusted Participation Rate (%)	82.34	61.14	57.25	78.13
OTHER	Number in Population	1,221,727	304,488	26,46	1,552,679
	% of Population	.86	.22	.02	1.10
	Unadjusted Participation Rate (%)	77.86	62.741	56.68	73.89
TOTAL	Number in Population	10,650,861	3,577,664	637,981	14,866,506
	% of Population	7.55	2.54	.45	10.54
	Unadjusted Participation Rate (%)	47.96	46.03	36.61	47.01

Source: U.S. Summary Detailed Characteristics, 1970.

TABLE VI

UNADJUSTED LABOR FORCE PARTICIPATION RATES, BY MARITAL STATUS AND RESIDENCE, FOR NONWHITE WOMEN 30 to 44, 1970

MARITAL STATUS		URBAN	RURAL		TOTAL
			Nonfarm	Farm	
	Number in Population	1,564,320	245,966	28,443	1,838,729
MARRIED	% of Population	1.11	.17	.41	1.30
SPOUSE PRESENT	Unadjusted Participation Rate (%)	51.55	48.79	37.37	50.96
	Number in Population	218,319	32,191	3,751	254,261
NEVER-MARRIED	% of Population	.15	.02	.002	.18
	Unadjusted Participation Rate (%)	67.37	56.21	49.59	65.69
	Number in Population	687,343	67,769	4,446	759,558
OTHER	% of Population	.49	.05	.003	.54
	Unadjusted Participation Rate (%)	61.12	56.62	52.09	60.66
	Number in Population	2,469,982	345,926	36,640	2,852,548
TOTAL	% of Population	1.75	.24	.02	2.02
	Unadjusted Participation Rate (%)	55.61	51.01	40.41	54.86

Source: U.S. Summary Detailed Characteristics, 1970.

TABLE VII

SUMMARY OF HUSBAND'S ATTITUDE TOWARD WOMEN WORKING, BY PLACE OF RESIDENCE

PLACE OF RESIDENCE		HUSBAND'S ATTITUDE TOWARD WOMEN WORKING		
		Percentage Who Like It	Percentage Who Don't Care	Percentage Who Dislike It
SMSA	FARM	55.81	20.93	23.26
	NONFARM	52.70	24.36	22.94
	ALL	52.74	24.31	22.94
NONSMSA	FARM	66.67	20.51	12.82
	NONFARM	62.82	20.26	16.92
	ALL	63.40	20.30	16.30
TOTAL		56.52	22.89	20.59

in percentage terms by place of residence and land usage. (A more detailed breakdown of husband's attitude may be found in Table XXIV of the Appendix.)

When asked about their level of education, 3,039 (60 percent) of the respondents indicated that they had completed high school, some college, or four or more years of college. Of these, in turn, 52 percent were in the labor force at the time of the survey week. Eight hundred ninety seven had attended some college before concluding their formal education. Of these, 55 percent (496) were working or actively seeking a job during the week in question.

Of the 396 college graduates questioned, 248 (63 percent) were in the labor force in 1967. One hundred thirty one of the 5,083 respondents had gone beyond college in their pursuit of higher education. Of these, 98 (75 percent) were in the labor force. As can be seen, the percentage of individuals in the labor force increased with each increase in the level of education of the individual. (See Table XXVI of the Appendix for a more detailed summary of the educational levels of the women surveyed.)

Many of the women responding to the survey, 1,534 to be exact, indicated that they had taken a full-time company training program of at least two weeks in length or that they had taken technical, commercial, vocational or skill training courses at some time prior to the survey. Of these, 56 percent (865) were in the labor force in 1967, 224 of them indicating that they had at some time put their training to use. There were 669 respondents who were not in the labor force in 1967 but who had had some type of training. Of these, 173 (26 percent)

indicated that they had put their training to use on the job at some time in the past. Table VIII summarizes this count by place or residence.

Of the 1,711 whites in the survey who reported income for 1966, the average was $3,018.98. For nonwhites the average income was $2,200.53 from 999 report income.[4]

Looking at average income by place of residence, Table IX, we note that women working in SMSA-nonfarm areas have higher incomes, on the average, than those in any of the other areas. The white women of the sample had higher incomes, on the average, than the nonwhites. The average for all 2,710 women who reported income in 1966 was $2,717.27. (For more detailed comparisons, Table XXVII of the Appendix gives the average income by occupation, place of residence and land use for all respondents.)

Counts were done to determine the occupation-industry mix of the sample by residence. In Table X it can be seen that the highest percentage of workers fell in the clerical and kindred workers occupation in every residence classification except nonSMSA-farm. For this group the highest percentage was found in the farm laborers and foremen occupation category. In the industrial classification of the respondents, Table XI, none of the industries predominated. For the whole sample, the manufacturing, wholesale and retail trade, and professional and related services industries each employed over 20 percent of the women. Tables XXVII and XXIX of the Appendix give more detailed breakdowns of the occupations and industries of the women surveyed.

TABLE VIII

RESPONDENTS HAVING HAD TRAINING, BY LABOR FORCE STATUS AND PLACE OF RESIDENCE, 1967

Labor Force Status		SMSA		NONSMSA		TOTAL
		Farm	Nonfarm	Farm	Nonfarm	
Respondent in Labor Force	Had Training	5	630	26	204	865
	Put it to Use	2	163	8	51	224
Respondent Not In Labor Force	Had Training	5	478	17	169	669
	Put it to Use	1	127	4	41	173

TABLE IX

UNADJUSTED AVERAGE INCOME, BY PLACE OF RESIDENCE,
OF THE WOMEN SURVEYED, 1966

PLACE OF RESIDENCE		WHITE		NONWHITE		ALL	
		Unadjusted Average Income	Number In Sample	Unadjusted Average Income	Number In Sample	Unadjusted Average Income	Number In Sample
SMSA	FARM	$2,289.19	16	$1,940.00	3	$2,234.05	19
	NONFARM	3,311.29	1,071	2,650.33	672	3,056,46	1,743
NONSMSA	FARM	2,351.99	70	856.53	51	1,721.67	121
	NONFARM	2,559.25	554	1,347.28	273	2,159.17	827
ALL		$3,018.98	1,711	$2,200.53	999	$2,717.27	2,710

TABLE X

PERCENTAGE DISTRIBUTION OF OCCUPATIONS OF WOMEN SURVEYED, BY PLACE OF RESIDENCE, 1967

OCCUPATION	SMSA		NONSMSA		TOTAL
	Farm	Nonfarm	Farm	Nonfarm	
Professional, Technical and Kindred Workers	6.98	10.42	8.06	9.62	10.02
Farmers and Farm Managers	-	.09	1.83	.26	.24
Managers, Officials, and Proprietors (Not Farm)	-	2.84	1.10	3.21	2.84
Clerical and Kindred Workers	34.88	33.20	17.58	26.05	30.22
Sales Workers	-	6.46	4.40	5.50	6.00
Craftsman, Foremen, and Kindred Workers	-	.99	1.83	.92	1.00
Operatives and Kindred Workers	11.63	17.77	11.36	18.26	17.52
Private Household Workers	9.30	7.94	7.69	9.10	8.29
Service Workers (Except Private Household)	25.58	16.38	10.26	16.23	16.08
Farm Laborers and Foremen	11.63	.56	24.91	4.06	3.01
Laborers (Except Farm and Mine)	-	.28	.37	.59	.37
Not Reported	-	3.06	10.62	6.22	4.39
Total[a]	100.00	100.00	100.00	100.00	100.00

[a]Percentages may not add to 100.00 due to rounding.

TABLE XI

PERCENTAGE DISTRIBUTION OF INDUSTRIAL CLASSIFICATION OF WOMEN SURVEYED, BY PLACE OF RESIDENCE, 1967

INDUSTRY	SMSA		NONSMSA		TOTAL
	Farm	Nonfarm	Farm	Nonfarm	
Agriculture, Forestry and Fisheries	11.63	.96	27.47	4.77	3.62
Mining	-	.15	-	.13	.14
Construction	2.32	.43	-	.59	.47
Manufacturing	11.63	22.01	13.92	21.58	21.36
Transportation, Communication, and Other Public Utilities	2.32	4.39	1.83	2.22	3.58
Finance, Insurance and Real Estate	-	5.56	3.30	2.88	4.59
Business and Repair Services	4.65	2.32	-	1.18	1.87
Personal Services	18.60	13.85	11.36	15.43	14.24
Entertainment and Recreation Services	-	1.17	.73	.85	1.02
Professional and Related Services	18.60	20.43	14.28	20.40	20.08
Public Administration	6.98	4.23	3.30	3.40	3.96
Not Reported	-	3.15	10.62	6.34	4.49
Total[a]	100.00	100.00	100.00	100.00	100.00

[a]Percentages may not add to 100.00 due to rounding.

FOOTNOTES

[1]Tapes summarizing the results for any sex-age group may be ordered from the Chief, Demographic Surveys Division, Bureau of the Census, U.S. Department of Commerce, Washington, D. C.

[2]The actual racial breakdown of the survey was "white", "black", and "other", but the number in the "other" category was so small (87) that it has been grouped together with the number in the "black" category to form a "nonwhite" category. This is then carried out throughout this study.

[3]Due to the difference in the sampling ratios of the races, and to facilitate comparison with actual Census data, the whites and nonwhites are analyzed separately in Tables III, IV, V and VI.

[4]The average income from the 957 blacks reporting income was $3,018.98. Other races showed an average income of $2,738.61 for 42 respondents.

CHAPTER V

RESULTS OF THE PROBABILITY OF LABOR FORCE PARTICIPATION MODEL

Regression Methods in the Analysis of Labor Force Participation

To estimate the relationship between two or more variables, regression analysis is often used. It has been employed in many of the recent studies of female labor force participation. As well as indicating the ability of the total equation to explain the variation in the data, it allows the importance of each of the independent variables to be measured.

In the prior studies that made use of this statistical technique, various types of dependent variables were employed. In Mahoney [22] a dummy variable for labor force participation was used. A value of unity indicates some participation during the period in question and zero indicates nonparticipation. Interpretation of the results is in the form of a probability statement as to whether the woman is expected to be part of the labor force. This is the nature of the first model of this study. Other studies have used hours worked during a certain time period as the dependent variable [26]. The second model of this study (see Chapter VI) uses consumption hours during the week (a "reciprocal" of working hours) and employs some of the theoretical

results of Becker [3]. The result is an estimate of the demand for consumption time of women and, thus, an estimate of the supply of working time. A few studies have also employed the labor force participation rate of a particular labor market in question as the dependent variable [5].

The independent variables which serve as predictors were all basically of the same nature in each of the studies regardless of the type of dependent variable. They included personal characteristics of the woman, family structure variables, attitudinal measures, income, education, work experience, and, possibly, some indication of residence or distance to job opportunities. This study has employed measures or proxies for each of these basic categories of variables. Like most of those reviewed, this study assumes that linear relationships are reasonable approximations of the form of the true relationships.

The general form of the multiple regression equation is:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \ldots + \beta_k X_{ki} + u_i \qquad (5.1)$$

where

$i = 1, 2, \ldots, n$ observations

Y_i = ith observation of the dependent variable,

$\beta_0, \beta_1, \beta_2, \ldots, \beta_k$ = unknown parameters,

$X_{1i}, X_{2i}, \ldots, X_{ki}$ = ith observation on the k independent variables, and,

u_i = unknown error or disturbance terms.

The method of computation for the β coefficients is least squares, which minimizes the variance of all error terms; i.e., the method maximizes the portion of the total variance in the dependent variable that

is explained by all independent variables. If least squares estimates are to be unbiased and of minimum variance, there must be some assumptions made concerning the general model [17, pp. 122-123].

1. The u_i (error terms) must be random variables with the expected values, or means, of their distributions equal to zero.

2. The u_i have a constant variance σ^2 for all sets of values of the independent variables X and the u_i are not correlated with one another.

3. The numbers X_{1i}, X_{2i}, ..., X_{ki} are constant and not subject to random variation.

4. The number of parameters to be estimated (k) is less than the number of observations (n) and no exact linear relationships exist among any of the X variables.

There are problems encountered in the event that the dependent variable is a dummy (takes on the values "0" and "1", only). The assumption of homoscedastic disturbances has been shown to be untenable in this situation.[1] Beyond this, care must be exercised in carrying out significance tests on the coefficients of such variables [17, pp. 176-186].

The least squares procedure used to estimate the coefficients gives the estimated regression equation:

$$\hat{Y}_i = b_o + b_1X_{1i} + b_2X_{2i} + \ldots + b_kX_{ki} \qquad (5.2)$$

where

$\hat{Y}_i$ = the estimate of Y_i for the ith observed values of the X's and

b_0, b_1, b_2, ..., b_k are the estimates of β_0, β_1, ..., β_k.

Then, the observed value for the ith Y is:

$$Y_i = b_0 + -_1X_{1i} + b_2X_{2i} + \ldots + b_kX_{ki} + e_i \qquad (5.3)$$

where

$e_i = Y_i - \hat{Y}_i$ is the unexplained variation to be minimized by the equation.

A multiple regression computer routine was used to estimate alternative regression equations for each of the models of this study. The t-test and standard errors are computed for every independent variable in the model statement of the run. Other statistical values for the predicted equation computed by the routine include the square of the multiple correlation coefficient (R^2), the overall F-value, partial sums of squares values and the partial F-values.

The adequacy of the model and the precision and accuracy of all estimates are evaluated with criteria such as R^2 and the overall F-test value. The main test of the importance of each independent variable in the equation is the t-test which compares the computed t-value to a tabulated value. (For a more detailed discussion of the examination of the regression equation, see [9, pp. 115-124].) These criteria served as the major deciding factor as to which variables should be maintained and which should be dropped from the model.

Description of the Variables

The dependent variables of the first model resulting from this study of the Ohio State's survey data was a dummy variable for labor force participation.

LFP = 1 if the respondent was working or actively seeking work during the week in 1967

= 0 otherwise

The objective of the analysis was to determine what effect the independent variables, whose descriptions follow, would have on the probability of the woman being in the labor force.

A dummy variable indicating the race of the individual was included in the analysis.

(1) Race

RACE = 1 white

= 0 nonwhite

One would suppose, and recent literature would seem to corroborate, that a nonwhite woman would be more likely to be in the labor force than a woman of the white race since she is more likely to be either supporting herself or augmenting her family's income.

(2) Marital Status

MS = 1 "single"

= 0 married, spouse present

The hypothesis behind the inclusion of this variable is that when it takes on the value "1", that is if the woman were never married, separated, divorced, widowed, or married with spouse absent, the probability of her being in the labor force would be increased since she would be supporting herself rather than relying on her husband to provide the family's major source of income.

(3) Family Size

FS = actual number in the family

The inclusion of this variable was to determine if the number in the family spending unit would affect the likelihood of the woman being in the labor force, the hypothesis being that an increasing number would increase the probability of her presence in the labor force.

(4) Presence of Children under Six

CHILD = 1 at least one child under six years of age in the household

= 0 no children under six present

As nearly all of the past studies indicate, the presence of young children is a definite deterrent to the labor force participation of the mother.

(5) Place of Residence

FARM = 1 respondent living in an SMSA and indicating that the land usage was farm

= 0 otherwise

NFARM = 1 respondent living in an SMSA and indicating that the land usage was nonfarm

= 0 otherwise

NSFARM = 1 respondent was not living in an SMSA and indicating that the land usage was farm

= 0 otherwise

A major objective of this model was to determine if place of residence was influential in the labor force participation of women and these dummy variables were included to that end. If all three had values of zero, the woman would be living in a nonfarm-nonSMSA category of residence. Moving her to different categories would have these hypothesized effects upon the probability of her being in the labor

force: (a) if she lived in an SMSA the probability of participation would increase since the opportunities for jobs are likely to be greater and the distance to the job is likely to be less, thereby encouraging more women who want outside work to find it; and (b) in a nonSMSA-farm area job opportunities are likely to be fewer in number and distances to them greater but the woman might also be involved in the actual working of the farm, and therefore, unlikely to be looking for "outside" work; i.e., she is probably less likely to be involved in the labor force than her counterpart in a nonSMSA-nonfarm category.

(6) Work Experience

WORK = actual number of years since leaving school in which the respondent worked at least six months

This variable enters the analysis with the hypothesis that if the woman has spent any time at all in the work force it is more likely that she will currently be working. If the woman has never worked she may think that it is not worth the initial effort of looking for a job so she is content to do other things instead. The woman who has worked may feel that reentry into the labor force may not be quite as traumatic as was the first entry.

EWORK = actual number of years between leaving school and some major event, in which the respondent worked at least six months

In an effort to refine the variable described above and to eliminate some of the bias that would enter the analysis due to the high overshadowing of the variable by the women currently in the labor force this variable was defined. If the woman has never worked, it is set at zero. If she has never married and has no children it has the same

value as WORK; i.e., it would equal the number of years since leaving school that she has worked. For the never-married respondent with children the variable's value is the number of years she had worked between leaving school and the birth of her first child. The value of EWORK for the married respondent is the actual number of years worked between leaving school and her first marriage.

(7) Woman's Attitude Toward Work

WATT = 1 respondent, at age 15, lived in the suburb of a large city, in a city of 25,000 to 100,000 or in a large city (100,000 or more)

= 0 respondent lived, at age 15, on a farm or ranch, in the country, or in a town or small city (under 25,000)

This variable is a proxy for the woman's attitude toward work. If she were living in a large city, a city of 25,000 to 100,000 people or in the suburb of a large city at the age of 15, the hypothesis is that she would be more likely to be in the labor force in later years. This could be the result of exposure to the more liberal atmosphere of the more populated areas where a working wife would be less out of the ordinary and viewed with less scorn than in the less populated areas. Today, perhaps, this distinction of liberal-urban areas and conservative-rural areas could not be so sharply made, but it must be remembered that these women are in their thirties and forties and some fifteen years have passed since their teens. Keeping in mind the changes that have occurred in our society's attitude toward women in general and their labor force participation in particular, and the fact that an individual is slow to change her opinions this hypothesis seems to have

some validity. We would expect a positive relationship between WATT and labor force participation.

(8) Husband's Attitude

HATT = 1 woman is married and the indication is that her husband likes the idea of women working

= 0 woman is single or indicates that her husband does not care either way about the idea of women working

= -1 indicates that her husband does not approve of the idea of women working

The hypothesized relationship concerning this variable is based on the premise that the husband's opinion may influence the wife's decision to work. Therefore, if he approves of women working he is more likely to encourage his wife to work if she indicates a desire to do so. However, if he does not approve of women working then his wife will be less likely to be in the labor force. The expected relationship between HATT and labor force participation is positive.

(9) Husband's Income

HI = actual 1966 dollar amount of husband's income

As the husband is usually the "bread winner" of the family, the amount he brings home is seen to be a major influence in his wife's labor force decision. The hypothesis, fairly well substantiated in recent studies, is that the larger his income the less likely it is that the wife will be in the labor force.

(10) Other Family Income

OFI = actual 1966 dollar amount of income of all family members except the respondent

The major component of this variable is the husband's income. However, some of the older children may be at work and contributing to the family's income and be paying some of their own expenses. There may also be other adults present in the household who contribute to the total family income (or who relieve the women of some of her home responsibilities). This variable is present in the analysis to determine if the likelihood of the respondent being in the labor force will decrease as this dollar amount increases.

(11) Education

EDUCA = 1 respondent is a high school graduate and completed no more formal education

= 0 otherwise

EDUCB = 1 respondent attended some college, but did not graduate, or received some technical training

= 0 otherwise

EDUCC = 1 respondent graduated from college

= 0 otherwise

Each increasing level of education is hypothesized to increase the probability of the woman being a member of the labor force.

(12) Public Assistance

PUBLIC = 1 respondent or some member of her family receives some type of public assistance

= 0 otherwise

It is hypothesized that the woman whose family receives some type of public assistance, is less likely to be in the labor force.

Results of the Models

Results of several combinations of the seventeen independent variables with the LFP dependent variable indicating labor force status of the respondent are given in Table XII. For each model the multiple regression computer routine gives the estimated parameter for each independent variable and the computed t-value which, when compared to a tabulated value, indicates if the parameter is significantly different from zero. The R^2-value, measuring the proportion of total variation about the mean ($\overline{LFP}$) explained by the regression, is also given in the routine.[2]

General Predictive Ability

The first model was set up as the basic model to correct for race, marital status, presence of children in the household, residence, and education of the respondent. The intercept term of this model, .744, indicates the probability of a woman in the sample's age group (30 to 44 years) being in the labor force if she is a nonwhite and married, with her husband present in the household but with no children under six years of age, with less than a high school education, and living in a nonSMSA-nonfarm residence. If the woman were white the model indicates that this probability would decrease by .143. If she were "single" - never-married, separated, widowed, divorced or married with spouse absent - the probability would be .882 (= .744 + .138), indicating an increase in the likelihood of her being in the labor force. If there were a child under the age of six present in the household the probability would decrease by .197 to .547. The predicted

TABLE XII

PROBABILITY OF LABOR FORCE PARTICIPATION MODELS (LFP DEPENDENT VARIABLE)

VARIABLES		MODEL 1	MODEL 2	MODEL 3	MODEL 4	MODEL 5	MODEL 6	MODEL 7	MODEL 8	MODEL 9
SOCIAL STATUS	RACE	-.143	-.125	-.126	-.125	-.118	-.103	-.099	-.099	-.125
		(-9.104)**	(-7.863)**	(-7.889)**	(-7.854)**	(-7.509)**	(-6.549)**	(-7.001)**	(-5.257)**	(-7.870)**
	MS	.138	.088	.0	.090	.089	.124	.254	-.052	.095
		(7.387)**	(4.311)**	(4.290)**	(4.413)**	(4.437)**	(5.583)**	(13.062)**	(-2.146)**	(4.491)**
	FS						-.030			
							(-9.728)**			
	CHILD	-.197	-.188	-.188	-.187	-.179		-.145	-.175	-.186
		(-10.354)**	(-9.880)**	(-9.879)**	(-9.854)**	(-9.562)**		(-8.515)**	(-8.732)**	(-9.735)**
RESIDENCE	FARM	-.043	-.058	-.057	-.054	-.048	-.068	-.042	-.107	-.054
		(-.577)	(-.777)	(-.768)	(-.730)	(-.658)	(-.844)	(-.630)	(-1.188)	(-.725)
	NFARM	-.040	-.027	-.027	-.010	-.010	-.022	-.051	.014	-.011
		(-2.638)**	(-1.784)*	(-1.781)*	(-.652)	(-.625)	(-1.441)	(-3.792)**	(.826)	(-.676)
	NSFARM	-.020	-.051	-.050	-.054	-.049	-.046	-.027	-.075	-.054
		(-.647)	(-1.595)*	(-1.581)*	(-1.689)*	(-1.572)	(-1.264)	(-.966)	(-1.840)*	(-1.703)*
WORK EXPERIENCE	WORK					.004				
						(13.025)**				
	EWORK			.000449	.000453		.000662	.000391	.00047	.000447
				(1.502)	(1.518)		(2.307)**	(1.469)	(1.456)	(1.498)
ATTITUDES	WATT				-.048	-.046	-.033		-.035	-.047
					(-3.179)**	(-3.115)**	(-2.303)**		(2.225)**	(-3.153)**
	HATT						-.371	-.390		
							(-31.744)**	(-36.394)**		
	HI						-.0000239		-.000028	
							(-11.136)**		(-11.729)**	
	OFI		-.0000105	-.0000105	-.0000104	-.0000103		-.00000843		-.0000104
			(-6.111)**	(-6.131)**	(-6.032)**	(-6.102)**		(-5.508)**		(-6.053)**
	PUBLIC							.031		-.014
								(-2.271)**		(-.906)
EDUCATION	EDUCA	.035	.041	.040	.043	.037	.052	.044	.058	.042
		(2.443)**	(2.831)**	(2.772)**	(2.984)**	(2.589)**	(3.713)**	(3.437)**	(3.727)**	(2.927)**
	EDUCB	.051	.061	.060	.064	.060	.065	.058	.080	.064
		(3.559)**	(4.247)**	(4.223)**	(4.506)**	(4.226)**	(4.724)**	(4.567)**	(5.214)**	(4.494)**
	EDUCC	.136	.153	.151	.156	.144	.240	.191	.220	.154
		(5.204)**	(5.831)**	(5.766)**	(5.944)**	(5.584)**	(9.243)**	(8.118)**	(7.617)**	(5.821)**
	INTERCEPT	.744	.773	.770	.772	.718	1.101	.989	.847	.775
		(29.017)**	(29.745)**	(29.567)**	(29.671)**	(27.726)**	(39.504)**	(40.986)**	(29.879)**	(29.534)**
	R^2	.077	.084	.084	.086	.115	.291	.274	.113	.086
	N	5083	5083	5083	5083	5083	4281	5083	4280	5083

Note: The values in parentheses below the predicted coefficients of the independent variables are the computed t-values for each variable.

**Significantly different from zero at the 5% level.

*Significantly different from zero at the 10% level.

parameters for the educational variables seem to indicate that each increase in the woman's educational level has a positive effect on the probability of her being in the labor force. Having completed high school, all other things the same, will increase the probability by .035; some college and/or some technical training will result in an increase of .051 in the probability of labor force participation. Completing college, according to this model, will increase the probability to .880 (= .744 + .136).

The coefficients of the residence variables for this model may be interpreted as follows. When compared to a woman who has a nonSMSA-nonfarm residence the SMSA-farm dwelling woman is less likely to be in the labor force. The probability decreases from .744 to .701, if all other things remain the same - the woman described by the intercept term is compared to a woman with the same characteristics and family status with the only difference arising in residence. The decrease in probability for the SMSA-nonfarm woman is .040 and for the nonSMSA-farm respondent is .020. All 5,083 observations were used in this model and the resulting R^2-value was .077.

In general, for all the dummy variables in the models when the respondent possesses the quality described by the dummy (the value of the dummy is "1") a positive sign on the coefficient indicates an increase in the probability while a negative sign means a decrease. For the variables that are actual values, the interpretation is that a unit increase in the variable's value will increase or decrease the probability of labor force participation if the coefficient's sign is positive or negative, respectively.

The values in the table in parentheses below the predicted coefficients of the variables in each model are the computed t-values of the coefficients. When these computed values are compared to tabulated values for the sample size in question the level of the variable's significantly different from zero - can be determined. In Table XII, the ten percent significance level is indicated by one asterisk (the coefficient is significantly different from zero at the one percent level) or two asterisks if the significance level is five percent. In the first model all the variables present in the analysis are significant at the five percent level except the two residence dummies, FARM and NSFARM. The t-values for these variables tell us that on the basis of the data the hypothesis that their coefficients are equal to zero cannot be rejected.

For most of the models all 5,083 observations are used implying that each observation contains values for each variable in the model. Model 6 uses husband's income (HI) rather than other family income (OFI) in its analysis of the data. When this variable is used the sample size is decreased due to the failure of some women to volunteer the information concerning their husband's income in 1966, leaving this variable blank and causing the computer routine to drop the observation from the analysis. When OFI is used, if HI is blank it is assumed to be zero and then the yearly income amount of the other family members (excluding the husband and wife) is used as the value of OFI rather than the sum of husband's income and the income of other members of the family, as would normally be the case.

The measure of the proportion of total variation about the mean explained varies from model to model. These R^2-values are all quite

small, though, which is partially due to the form of the dependent variable and that the variable related to an individual's probability rather than group probabilities. Such results are consistent with other similar studies.[3] The lowest R^2-value is attained in the first model in which race, marital status, children, residence, and education are the only "corrections" made in the data. Only 7.7 percent of the total variation was explained. The highest R^2-values were attained in Models 6 and 7 - .291 and .274, respectively. These are the only models which contained the variable on husband's attitude, HATT, and would be considered the "best" predictive models if the R^2-value were used as the criterion. However, these models also had intercepts either greater than one to too close to one for realistic values when working in a probability framework.[4]

Performance of the Independent Variables

Social Status Variables. The variables concerned with the woman's social status all performed as expected. RACE and MS, used in each model run, were always highly significant. FS was used in the models where CHILD did not appear and both were highly significant whenever they were used.

The results of the presence of RACE in each model would seem to corroborate with the findings of past research and the hypothesis of this study - if a woman is white (RACE = 1), the probability of her participating in the labor force is less than that of a nonwhite woman. This decrease in probability ranged from .091 to .143 in the nine models run.

The marital status of the woman as indicated by the value of MS affects the likelihood of her labor force participation consistently throughout the models. If the woman is "single" - never-married, married with husband absent, widowed, separated, or divorced - MS would equal "1", and, as the results show for all models the probability of her being in the labor force would be greater than that of the woman who is married with her husband present in the household. In Model 2, after correcting for race, presence of young children, residence, other family income, and education, the coefficient of MS would indicate an increase in the probability of labor force participation from .773 (the intercept's value) to .861 (= .773 + .088).

As the size of the family (FS) or the number in the household increases, the probability of the woman being a member of the labor force decreases. This would seem to indicate that an increasing number of household members increases the home responsibilities of the woman thereby decreasing the likelihood of her working outside the home. This decrease in probability is less than the decrease found when a child (children) under six years of age is (are) present in the household.

The presence of young children (CHILD = 1) consistently decreases the probability of a respondent's presence in the labor force. This concurs with the results of past studies. The decrease is even large enough in most models to outweigh the increase in probability due to the attainment of any educational level from high school graduate and beyond.

Education. The attainment of a higher educational level by a woman would seem to be an indication that she will be more likely to participate in the labor force than the woman who has failed to complete high school. Attaining that high educational level may signify an already strong desire on the woman's part to be active in the labor force and that she is becoming better educated to promote that end. Nevertheless, the results of this study's analysis would suggest this and, in doing so, would tend to corroborate past studies' findings.

The high school graduate (EDUCA = 1) is more likely to be in the labor force than the woman who has not completed high school. Some college (3 years or less) and/or training of some sort increases the probability even more. When the woman is a college graduate or has gone beyond college there is a large increase in the probability. For instance, in Model 1 the probability increase corresponding to each of the three educational levels is .035, .051, and .136, respectively. In virtually all the models the increase in probability for the college graduate is more than three times the increase for the high school graduate.

Work Experience. The two variables set down in the models to quantify work experience and to determine its significance in the labor force decision of women lead to the following implications. Each year of six-month early work experience (EWORK) will increase the probability of current labor force participation but not significantly. When all the years of six-month work experience (WORK) were included the probability increased at a highly significant level. This would suggest that recent work experience is a more influential factor in the

current labor force status of the woman than is that which occurred upon leaving school.

Family Income. Husband's income plays an extremely important role in determining the labor force status of the married woman. In Model 6 for instance, for a $1,000 increase in the husband's income for 1966, the probability of the wife being in the labor force in 1967 decreased by .0239. This corresponds to the results of past studies and would suggest that the working wife is in the labor force primarily to augment the family's income and would be less likely to be participating if her husband's income were to increase.

Other family income, the income of the husband plus any income earned by the other members of the family (excluding the wife), is quite significant. Its influence does not decrease the probability quite as much as HI, however. To illustrate, in Model 4, for a $1,000 increase in OFI the probability will decrease by .0104 and in Model 8, that corrects for all the same influences as the fourth model except that it uses HI rather than OFI as a measure of family income, the decrease accompanying a $1,000 increase in husband's income is .028.

Public assistance as a source of family income has a consistently negative influence on the probability of participation of the woman. In Model 7, when it appears in connection with the husband's attitudinal variable, its coefficient was found to be significantly different from zero. However, when it is used in a model uncorrected for husband's attitudes toward women working, Model 9, it loses its significance and its coefficient decreases in absolute value. In general, though, in a family that receives public assistance of some sort the

woman is less likely to be in the labor force than her counterpart in a family where public assistance is not received.

Attitudes. The attitudinal variables did not perform as expected. Crudeness of the measures in both cases may have greatly influenced their performance in the analysis. As they are defined, though, they are highly significant in each model in which they appeared.

The woman's attitude is proxied by her place of residence at 15 years of age. The results of the regression runs would indicate that if she had lived in the suburb of a large city, in a city of 25,000 to 100,000 or in a large city (100,000 or more) she would be less likely to be in the labor force than the woman who had lived on a farm or ranch, in the country, or in a town or small city (under 25,000). This is in direct contradiction to the hypothesis set down when this variable was defined.

The variable concerned with husband's attitude was constructed from a question asking each woman, if she were married, the opinion of her husband concerning the idea of her working. Perhaps the fact that the question is asked of the woman has caused a bias to enter the results. At any rate, the predicted value of the coefficient of HATT indicates a decrease in the participation probability when the woman indicates that her husband likes the idea of her working and an increase when she had indicated that he does not approve of the idea. The fact that this variable's coefficient is significantly different from zero in every appearance it makes in the models lends strength to the idea that a bias of some kind has entered the analysis.

Residence. In all models correcting for place of residence of the respondent, all three classifications (FARM, NFARM, NSFARM) had negative signs. Interpreting this sign, we find that any respondent from an SMSA-farm area, an SMSA-nonfarm area, or a nonSMSA-farm area is less likely to be in the labor force than a woman from a nonSMSA-nonfarm area. It had been hypothesized that the sign for NFARM would have been positive since a metropolitan area is thought to have more job opportunities and a resident of such an area would have shorter commuting time, and thus, less commuting expenses, and therefore, would be more likely to be in the labor force.

In a few of the models the coefficients of some of the dummies were significantly different from zero, but in most cases the data could not reject the hypothesis that the coefficient of each residence dummy was equal to zero. Despite the hypothesis of expected differences due to residence as stated by the author, this insignificance of residence has been the rule rather than the exception in past studies of women's labor force participation [14].

Table III and IV illustrate that slightly lower participation rates were exhibited in nonmetropolitan areas for the unadjusted data. When the raw data were adjusted for the lower income levels, lower educational levels, larger families, and less work experience typical of these areas and their residents, the three residence variables were found to be insignificant in explaining any remaining variation in labor force participation.

Conclusions

The results of the probability of labor force participation model for the women in the age range 30 to 44 surveyed seem to correspond to the results of past studies. The influences of the social status, education, family income, and even the residence variables on the participation of the woman in the labor force were consistent with the effects of these types of variables in other analyses.

The additional factors presented for this study - work experience measures, attitudinal indexes, and an indication of the receipt of public assistance - pointed up some factors that future studies could refine and test again. The significance of these factors in some models and insignificance in others seems to suggest that more work should be done on them.

FOOTNOTES

[1]A. S. Goldberger, Econometric Theory (New York, 1964) pp. 249-250.

[2]Simple correlation coefficients for this model and all others may be found in Appendix Tables XX, XXI, XXII, and XXIII.

[3]See D. W. Holland "The Geographic and Income Class Distribution of the Benefits and Costs of Public Education - Implications for Common School Finance." (Unpublished Ph.D. dissertation, Oklahoma State University, 1972), Freddy Kent Hines "Optimal Allocation of Funds for Schooling Among Geographic Divisions within the United States." (Unpublished Ph.D. dissertation, Oklahoma State University, 1970), and Paul Johnson, "Labor Mobility: Some Costs and Returns", Rural Poverty in the United States - A report by the President's National Advisory Commission on Rural Poverty (Washington, D. C., May, 1968).

[4]In instances like this or in the case that many of the predicted values resulting from the estimated model lie outside the interval from zero to one, transformations may be applied to the data to force it inside this range. Two popular transformations are the probit and the logit. See [30, pp. 628-635].

CHAPTER VI

RESULTS OF THE SUPPLY OF WORKING TIME AND INCOME MODELS

In Chapter V the emphasis was on the woman's decision to enter the labor force and the factors influencing this decision. In this chapter the aim is to analyze the factors affecting the time the woman is willing to supply in the labor market and, once she is in the labor force, the factors affecting the income she earns.

Supply of Working Time Model

The Model

Many of the same factors that influence a woman's probability of labor force participation affect the amount of time the woman spends in the home, and therefore, the time she can supply in the labor market. Becker's [3] division of time into work hours and "consumption" hours, rather than the classical labor-leisure distinction, and theoretical application to the allocation of time become the basis for the model presented here. (See Chapter II.)

Consumption hours per week is used as the dependent variable. If the woman is not working outside the home this variable is automatically valued at 168. When the woman is in the labor force, however, her hours at work per week are subtracted from 168 to arrive at the

time that woman spent in "consumption" activities. With the definition of

HOURS = actual hours worked per week of a woman in the labor force,

it follows that

CHOURS = 168 - HOURS actual number of hours of consumption time per week of the respondent.

Several of the independent variables used in the formulation of this model were initially defined for the probability of labor force participation model. Their definitions remain unchanged. RACE is hypothesized to affect consumption time in this manner: if the woman is white, she will be spending more of her time in consumption activities and, thus, supplying less time in the labor market. The single woman (MS = 0) will be spending less time in consumption activities, either due to fewer home responsibilities or because her marital status forces her to give up consumption time in favor of working time since she is supporting herself. Past studies have shown that the woman who pursues higher education possesses a stronger desire to participate in the labor force [25]. In fact, education has been used as an efficiency parameter under the premise that education makes a woman more efficient which causes her to use less time in doing her household chores and, therefore, have more time available for work outside the home [3, 16]. Thus, the expected relationship between education and consumption time would be negative and, in fact, each advancement by levels of education would cause a greater decrease in the time the woman spends in consumption activities.

Besides the variables discussed above, this model incorporated some additional ones that are important in the determination of a woman's time at home, and thus, her time available for the labor market.

(1) Woman's Wage

WAGE = dollar amount of the hourly wage of the woman

As the market wage increases the incentive to give up consumption time and supply more hours to the job is reinforced. The labor-leisure model, however, says there is some wage at which the woman will give up the income of an extra hour for one more hour of leisure (time off the job) - the supply curve becomes backward-bending at this point. (See Chapter II). For this reason the square of the wage variable was included (WAGE2).

The presence of young children in the household (CHILD = 1) would, based on the premise that youngsters take up large amounts of a woman's time, increase the number of consumption hours of the respondent or decrease the hours she is willing to supply in the labor force. Several additional variables were added to indicate the presence of family members in other age groups and the actual number of two age classes.

(2) Family Members

CHILD2 = 1 children over five and under nineteen years of age are present in the household

0 otherwise

ADULTS = 1 people over five years of age are present in the household

0 otherwise

NCHILD = actual number of respondent's children under six years of age

NCHILD2 = actual number of respondent's children over five and under nineteen years of age

When other adults are present in the household to help with home responsibilities it is postulated that the woman can reduce her consumption time and therefore, increase the time she is willing to supply in the labor market. Similarly when there are children present in the age group six to eighteen years the time of the woman can be less occupied with their care and work outside the home can be looked upon as being more interesting and desirable than if all the children were under six. Employing the actual number of children in these two age groupings as independent variables, one would expect that as the number in the younger age group (NCHILD) increases more of the woman's time is spent in the home and, thus, CHOURS increases. On the other hand, as NCHILD2 (the number of children between six and eighteen years of age) increases it is hypothesized that the time of the woman spent in consumption will decrease, i.e., the time she is willing to supply to the labor market will increase.

An increase in other family income (OFI) will increase the consumption time of the woman. This is based on the premise that this income increase will decrease the necessity of the woman being at work to augment the family's income. Similarly, if the woman or some member of her family receives some type of public assistance there should be an increase in the time she spends at home. The expected relationship between CHOURS and PUBLIC is positive.

The residence of the woman should affect the time she spends at home and, therefore, the time she can supply to market activities. As it enters into this model it is a proxy for the availability of jobs in the area, the ease for the woman of getting a job, labor market information and a woman's willingness to work. Thus, a woman residing in an SMSA with its postulated greater number of job opportunities and greater availability of information concerning them should be able and willing to give up time in consumption activities and offer more time to work outside the home. The farm woman with her greater home responsibilities is likely to be less willing to give up some of her time at home. Job information is usually less readily available to farm residents, also. The nonSMSA resident will find jobs less readily available than the SMSA resident and information concerning those available as hard to come by. Therefore, the SMSA-nonfarm dweller should be willing to supply more time at work than her counterparts in any of the other areas; the SMSA-farm more than the nonSMSA-farm and the nonSMSA-nonfarm more than the nonSMSA-farm.

A variable is introduced here to break down the SMSA dwellers further by a central city classification. Those residing in central cities of SMSA's are postulated to be able to supply more time at work outside the home. There are postulated to be more job opportunities, more information available concerning jobs, and greater ease in getting a job for these residents than for those who reside in the non-central cities of SMSA's. There should, therefore, be a negative relationship between CC and CHOURS.

(3) Central City Distinction

CC = 1 resident in central city of an SMSA

= 0 otherwise

The distance to the job as evidenced by the amount of time spent in commuting is hypothesized to affect the supply of a woman's working time and, thus, her consumption time. If the woman indicates she is not presently in the labor force (HOURS = 0) this variable enters with a value of zero. Otherwise, it is the number of minutes spent in commuting to the job.

(4) Commuting Time

CTIME = actual time (in minutes) spent in commuting to the job (one way).

All women who do work spend some of their time in commuting. Thus, initially the relationship between CTIME and CHOURS will be negative. However, there is postulated to be some level of commuting that, when reached, will discourage the woman from supplying more time in the labor market and, thereby, increase her consumption hours. At higher wage levels this limit will be reached at higher amounts of commuting time since women may be willing to extend their time in commuting because of the wage increase involved.

Results of the Model

General Predictive Ability. The first model shows the empirical results of the demand for consumption time and, thus, the supply of working time of women in the age group 30 to 44 years corrected for other family income, education, presence of children, race and marital

status. It is shown in the summary of results, Table XIII. The coefficients of the wage variables, in accordance with economic theory, indicate that at higher wage rates women are willing to give up more consumption time (supply more work time) but at a slightly decreasing rate. In Model 1, an increase in WAGE of $1.00 per hour will decrease consumption time (increase time at work) by approximately 4.4 hours per week. Other family income, when increased by $1,000 will increase a woman's time in consumption activities by .46 hours. The education variable's indicate a decrease in CHOURS of 1.89 hours for the high school graduate as compared to the consumption time of the woman who has not completed high school. The woman with some college and/or technical training decreases her consumption time by 2.54 hours, the college graduate by 2.49 hours.

Children under six present in the household increase the woman's time in the home by 7.6 hours. If there are children present in the six to eighteen age group consumption time increases, but only slightly, .20. A white woman spends more time in consumption activities than a nonwhite woman, 1.86 hours according to the model. The single woman spends less time at home - 3.70 hours - than the married woman. This model explained 14.4 percent of the variation about the mean ($\overline{\text{CHOURS}}$), as indicated by the R^2-value. All variables were significant in the regression (all coefficients significantly different from zero) at the five percent level except CHILD2, which indicated the presence of children in the older age group.

In general, the dummy variables with positive signs on their predicted coefficients indicate an increase in time at home for the woman if the condition described by the variable is true for that woman.

TABLE XIII

RESULTS OF THE DEMAND FOR CONSUMPTION TIME (SUPPLY OF WORKING TIME) MODEL

	MODEL 1	MODEL 2	MODEL 3	MODEL 4	MODEL 5	MODEL 6	MODEL 7	MODEL 8	MODEL 9	MODEL 10
WAGE	-4.444 (-19.620)**	-4.408 (-19.481)**	-4.296 (019.162)**	-4.414 (-19.419)**	-4.406 (-19.463)**	-3.588 (-16.212(**	-3.488 (-15.854)**	-4.006 (-10.781)**	-3.793 (-8.785)**	-2.731 (-12.980)**
WAGE2	.007 (19.436)**	.007 (19.304)**	.006 (18.915)**	.007 (19.330)**	.007 (19.284)**	.006 (16.076)**	.005 (15.684)**	.006 (10.973)**	.005 (8.235)**	.004 (12.865)**
OFI	.000465 (7.315)***	.000466 (7.336)**	.000513 (8.179)**	.000470 (7.398)**	.000452 (6.894)**	.000423 (7.215)**	.000417 (6.929)**	.000510 (3.945)**	.000476 (7.845)**	.000356 (6.265)**
OFI2								-.0000 (-.536)		
CTIME						-.496 (-30.532)**	-.485 (-29.711)**	-.928 (-29.689)**	-.906 (-28.902)**	-1.031 (-37.717)**
CTIME2								.008 (24.270)**	.008 (23.642)**	.008 (24.262)**
(WAGE)(OFI)								.000164 (4.888)**	.000150 (4.481)**	
(WAGE)(CTIME)								.025 (1.360)	.026 (1.428)	
(OFI)(CTIME)								-.0000341 (-8.637)**	-.0000330 (-8.510)**	
EDUCA	-1.891 (-3.440)**	-.1930 (-3.517)**	-1.717 (-3.159)**	-1.859 (-3.385)**	-1.961 (-3.568)**	-1.469 (-2.896)**	-1.456 (-2.886)**	-1.629 (-3.432)**	-1.515 (-3.199)**	-1.446 (-3.028)**
EDUCB	-2.541 (-4.675)**	-2.623 (-4.831)**	-2.382 (-4.429)**	-2.610 (-4.809)**	-2.678 (-4.911)**	-1.994 (-3.968)**	-2.063 (-4.116)**	-1.666 (-3.526)**	-1.609 (-3.417)**	-1.608 (-3.390)**
EDUCC	-2.486 (-2.473)**	-2.704 (-2.694)**	-2.632 (-2.642)**	-2.474 (-2.452)**	-2.729 (-2.717)**	-2.530 (-2.728)**	-2.704 (-2.930)**	-1.981 (-2.275)**	-2.056 (-2.371)**	-1.935 (-2.206)**
CHILD	7.609 (6.871)**	13.429 (8.813)**		13.341 (8.756)**	13.470 (8.835)**	5.744 (5.605)**		4.366 (4.551)**		
CHILD2	.200 (.212)					-.484 (-.555)		-.211 (-.258)		
ADULTS		-5.905 (-4.210)**		-5.968 (-4.256)**	-5.889 (-4.196)**					
NCHILD			4.557 (13.268)**				3.185 (9.856)**		2.211 (7.236)**	2.360 (7.677)**
NCHILD2			1.070 (6.022)**				.717 (4.313)**		.614 (3.932)**	.585 (3.709)**
RACE	1.861 (3.074)**	1.831 (3.030)**	2.948 (4.864)**	1.855 (3.071)**	1.905 (3.133)**	-1.723 (3.008)**	-.420 (-.697)	-2.365 (-4.385)**	-1.693 (-3.088)**	-1.677 (-3.038)**
MS	-3.703 (-4.792)**	-3.734 (-4.839)**	-4.322 (-5.845)**	-4.245 (-5.284)**	-3.824 (-4.904)**	-1.847 (-2.576)**	-2.778 (-3.983)**	-2.860 (-3.968)**	-3.438 (-5.121)**	-2.555 (-3.727)**
PUBLIC				1.347 (2.270)**						.876 (1.699)**
FARM					-.679 (.240)		-.327 (-.127)	.006 (.002)	-.798 (-.293)	-.318 (-.131)
NFARM					.616 (1.064)		1.436 (2.314)**	2.478 (4.926)**	2.505 (4.747)**	2.398 (4.746)**
NSFARM					-.038 (-.032)		-.248 (-.222)	-.117 (-.111)	.717 (.629)	-.157 (-.149)
CC							.935 (1.490)			
(WAGE)(FARM)									1.262 (.473)	
(WAGE)(NFARM)									-.094 (-.236)	
(WAGE)(NSFARM)									-3.525 (-2.050)**	
INTERCEPT	146.470 (160.085)**	146.446 (160.54)**	148.029 (191.865)**	146.282 (158.919)**	146.181 (146.515)**	154.925 (173.726)**	154.661 (181.268)**	156.985 (164.815)**	157.749 (193.923)**	157.867 (192.820)**
R^2	.144	.147	.164	.148	.147	.286	.298	.378	.383	.372
N	5,083	5,083	5,083	5,083	5,083	4,998	4,998	4,998	4,998	4,998

NOTE: The values in parentheses below the predicted coefficients of the independent variables are the computed t-values for each variable.

**Significantly different from zero at the 5% level.

*Significantly different from zero at the 10% level.

A negative sign indicates a decrease in CHOURS. For those variables with actual amounts used as their values the coefficient indicates how a one unit change in the value of the variable will affect CHOURS; the sign indicates if it will increase or decrease consumption time.

All models employed all 5,083 observations except those using commuting time (CTIME) as an independent variable. In this instance, 85 had an invalid response for this question, leaving 4,998 observations on which the regression was then run. The models that did use CTIME had R^2-values which were considerably higher than those that did not correct for commuting time, indicating that a greater proportion of the variation about the mean was explained by these models.

Interaction terms, terms involving the product of two independent variables, are introduced in two of the models - Model 8 and Model 9. The effects of the interaction terms including the wage variable will be discussed in succeeding sections.

Wage Rate. The performance of WAGE in all the models, as well as the square of the wage rate (WAGE2), would indicate that consumption hours decrease for higher wage rates; i.e., at higher wage rates working hours increase. The magnitude of the squared term indicates that, within the range of the data, a backward-bending supply curve would not exist. The elasticity of individual supply of working hours for Model 1 evaluated at the mean wage rate and the mean of working hours is .15. This indicates that when the wage increases from its mean by one percent, time at home will decrease by .016 percent or time at work will increase .15 percent.

Family Income. OFI maintains its positive sign throughout the various models, indicating an increase in time at home as the income of family members increases. In Model 3, after corrections have been made for wage, education, number of children, race, and marital status of the woman, a $1,000 increase in OFI will increase CHOURS by .51 hour.

If someone in the woman's family is receiving some type of public assistance (PUBLIC = 1) there is a significant increase in her time at home, as seen by the coefficients of this variable in Models 4 and 10. This effect would occur primarily at lower levels of family income since families with lower incomes are the ones most likely to receive public assistance of some kind.

Consider the wage and other family income effects of Model 9 on the supply of working time:

$$\text{HOURS} = c + 3.793\ \text{WAGE} - .005\ \text{WAGE}\ 2 - .00476\ \text{OFI} - .000150\ (\text{WAGE})\ (\text{OFI}) \qquad (6.1)$$

The constant term, c, includes the adjustment on working hours of all other independent variables as well as the transposing of CHOURS to HOURS. All regression coefficients are significant at the five percent probability level. At a given wage level, the supply of working time decreases as other family income increases. Furthermore, at higher wage rates, the supply of working time decreases at a faster rate as other family income increases. As an example, at a $1.00 wage rate, for each $1,000 increase in OFI the supply of individual working time decreases by about .63 hours per week. At a wage rate of $2.00 per hour, HOURS decreases by about .78 for each $1,000 increase in OFI.

Commuting Time. The hypothesized negative relationship between CTIME and CHOURS, at least in the lower amounts of CTIME, is shown to be true in the models run with correction made for commuting time. When the square of CTIME is included in the model the level of commuting time that actually discourages women from supplying more time at work can be determined.

In Model 8 it is found that, for the data used in this study, CHOURS are at a minimum - working hours are at a maximum - when commuting time is 58 minutes. Any amount of commuting time over that amount will encourage the woman to stay at home rather than pay the increased commuting costs.

Looking at the interaction terms involving CTIME in Model 9 and their effects on time at work:

$$\text{HOURS} = c + 3.793\ \text{WAGE} - .005\ \text{WAGE2} + .906\ \text{CTIME} - .008\ \text{CTIME2} - .026\ (\text{WAGE})\ (\text{CTIME}) + .000033\ (\text{OFI})\ (\text{CTIME}) \qquad (6.2)$$

Results of the reciprocal action of WAGE and CTIME indicate that, for a given wage rate, women are willing to offer more working time only at reduced commuting time. At higher given wage rates, however, the reduction in commuting time is less important. Alternatively, this may be stated that in order to maintain a given supply of working hours the wage rate has to increase at a decreasing rate for increased CTIME. It should be noted that the interaction coefficient between the wage rate and commuting time is not statistically significant from zero at the ten percent probability level.

As stated earlier, OFI has a negative relationship with HOURS and commuting time has a positive relationship with working hours at

shorter commuting times but a negative relationship at longer commuting times. The net effect of the interaction term of OFI and CTIME on HOURS is positive and statistically significant at the five percent level. It may be hypothesized that the square of the interaction term would be negative and that higher commuting times and higher other family income levels may have an increasingly dampening effect on the supply of working time.

Education. As suggested from the theory of the supply of working time and the results of the LFP model, a formal education of high school or greater causes an increase in the time the woman is willing to supply in the labor market. Each increase in level from high school graduate to some college and/or technical training to college graduate, in fact, is seen to decrease a woman's time at home, thereby increasing the time she is willing to supply in the labor market.

Looking at Model 6 (Table XIII) after correcting for various factors, the high school graduate spends 1.47 less hours at home than a woman with less education, the woman with some college and/or technical training 2.00 fewer hours, and the college graduate 2.53 fewer hours.

Family Members. When children under six years of age are present in the household (CHILD = 1) there is a significant increase in the time the woman respondent spends in the home. In Model 5, for instance, after correcting for wage rate, other family income, education, race, marital status and residence the increase in consumption time indicated by the coefficient of CHILD is 13.47 hours per week. When CHILD2 = 1, children from six to eighteen years of age are present there is a

slight increase in CHOURS, in the first model, but a slight decrease in Models 6 and 8. In all these cases, though, the computed t-values indicate that the hypothesis that the predicted coefficients are equal to zero cannot be rejected.

The presence of family members over five years of age (ADULTS = 1) results in a significant decrease in the time of the woman spent in consumption. Again in Model 5 a decrease in CHOURS of 5.89 hours per week is predicted when corrections for the factors listed above have been made. It seems that these older family members will relieve the woman from some of her household duties and allow her to increase the time she is willing to supply in the labor force.

When the actual number of children in the age groups under six years (NCHILD) and six to eighteen years (NCHILD2) their predicted coefficients were always significantly different from zero. In Model 7 after correcting for wage rate, other family income, commuting time, education, race, marital status, and residence, including the central city distinction, it is indicated that an additional child in the younger age group will increase time at home of the woman by 3.18 hours per week. An additional child in the older age group will decrease a woman's time at home by .72 hours per week. Of all the variables concerning family members, these give the most consistent results in the regression runs.

Race. The results in terms of this variable are very interesting. In the models uncorrected for commuting time there is a positive relationship between RACE and CHOURS indicating that white women spend more time in consumption activities than nonwhite women. In Model 6, though,

CTIME is included in the model and the sign of the race variable became negative with t-value indicating the coefficient is significantly different from zero. This would seem to be resulting from the fact that nonwhites tend to live closer in than whites and, thus, when the models are corrected for commuting time, the nonwhites are spending more time at home.

In an effort to determine if this really was the case, Model 7 included CC in its analysis. Even when this central city distinction was included under the premise that more jobs are located in the central cities of SMSA's, the coefficient of RACE remained negative. This would seem to imply that no matter where the jobs are located, nonwhites always live closer to their work than whites and hence commuting time is less. Thus, the white woman is spending more time away from home.

Marital Status. The models consistently suggest that the single woman (MS = 1) is spending less time at home than the married woman. In Model 7, which corrects for commuting time and the numbers of children both under six years of age and between six and eighteen years of age, the single woman is willing to supply almost three more hours per week in the labor market than the married woman.

Fewer home responsibilities, if the woman has never married, or a greater inclination to give up time at home, if she is the head of the household - chief "bread winner", may be the reasons behind the consistent indication that the single woman will spend less time at home. At any rate, this result concurs with the hypothesized relationship between MS and CHOURS.

Place of Residence. In Model 5 the residence variables, when commuting time is absent, are not significantly different from zero; i.e., residence has no significant effect on consumption time or hours at work. When commuting time in included in the linear and quadratic forms, Model 7 and Model 8, the coefficient of NFARM is statistically different from nonSMSA-nonfarm, accounted for in the intercept. It is interpreted as meaning that, all other factors the same, an SMSA-nonfarm woman is willing to offer fewer hours at work than a nonSMSA-nonfarm woman.

The place of residence is known to influence the hourly wage rate. To determine the influence of the two forces together on the time of a woman at home, interaction terms with the wage rate and the three residence variables are included in the analysis in Model 9. Comparing SMSA-nonfarm and nonSMSA-nonfarm:

$$\text{HOURS} = c + 3.793\ \text{WAGE} - .005\ \text{WAGE2} - 2.505\ \text{NFARM} + .094\ (\text{WAGE})\ (\text{NFARM}) \qquad (6.3)$$

Remembering that the intercept term includes corrections for the nonSMSA-nonfarm resident it can be seen that it takes a higher wage rate to entice the SMSA-nonfarm woman to work the same number of hours as a nonSMSA-nonfarm woman. This is observed in metropolitan labor markets where higher wages must be offered to increase the supply of labor. When the wage level is initially high in both areas, it will take a smaller increase in wage rate for the SMSA-nonfarm woman to encourage her to offer the same number of hours at work as her counterpart in the nonSMSA-nonfarm area. (This results since the interaction term has a positive sign.)

When we compare the residence categories nonSMSA-farm and nonSMSA-nonfarm:

$$HOURS = c + 3.793\ WAGE - .005\ WAGE2 - .717\ NSFARM + 3.525\ (WAGE)(NSFARM) \quad (6.4)$$

The nonSMSA-farm woman, it seems, is willing to offer a given number of hours at work at a lower wage rate than the nonSMSA-nonfarm woman. The lower the wage rate becomes, the smaller the difference in HOURS becomes for these two residence categories.

Looking at the SMSA-farm and nonSMSA-nonfarm residences

$$HOURS = c + 3.793\ WAGE - .005\ WAGE2 - .798\ FARM - 1.262\ (WAGE)(FARM) \quad (6.5)$$

The equation suggests that at higher wages the SMSA-farm woman is willing to supply fewer hours in the labor market than the nonSMSA-nonfarm woman. Neither the coefficient of FARM nor that of the product of WAGE and FARM is statistically different from zero, however, and there is, therefore, no significant difference between the time an SMSA-farm woman will offer at work and that which a nonSMSA-nonfarm woman will offer. From the hypotheses set down concerning the residence variables, it seems that job entry, commuting costs, job information, and so forth are comparable for the women in these two categories of residence.

Conclusions

The household production - consumption model provides a strong theoretical foundation for analyzing the demand for consumption time and, thus, the supply of working time [3]. For the woman, many of the

factors that enter into her decision concerning labor force participation (Chapter V) affect the amount of time she spends at home - race, marital status, children, residence, other family income, and education, but additional factors are important influences in her decision as to the number of hours she is willing to supply in the labor market - market wage rate and commuting time, notably.

Empirical results from this analysis of the demand for CHOURS and, reciprocally, the supply of working time of the individual woman, using survey results of women in the 30 to 44 year range, allow the following conclusions to be made:

1. The empirical specification of the household production - consumption model possesses a fairly strong power for explaining the variations in the individual woman's demand for consumption time (supply of working time). This lends support to the premise that decisions concerning the hours the woman is at home are made in a family context where production is one of the household activities. (For data supporting similar conclusions see Huffman [14].)

2. Within the range of the data, a backward-bending supply curve of time at work does not exist. An estimate of the elasticity of the supply of working hours with respect to wage (from Model 1) evaluated at the mean wage rate and the mean of hours worked is .25; i.e., as the wage rate increases by one percent, time at work will increase by .25 percent, holding all other things equal.

3. There is a level of commuting time at which working hours are at a maximum - 58 minutes for the data used in this study. Increasing the wage rate will increase this level of commuting time to a new value at which working hours will be at a maximum for the new wage rate.

4. The premise that education increases the efficiency of the woman in home production activities as set down in the theory is corroborated by the results presented above. Huffman suggests, also, that education may have additional effects on the supply of working time by creating skills for analyzing and interpreting information, including the evaluation of job opportunities, thereby improving allocative efficiency [16]. The empirical results imply that the woman with more years of formal education is willing to supply more time in the labor market.

5. Children in the household are a definite deterrent to the woman working outside the home. Young children, especially, increase the demand for the woman's time in the home. When there are other adults in the household, their presence alleviates this demand to some extent as they help perform duties she would normally do by herself.

6. No matter where jobs are available, the results imply that the nonwhites live closer to them, reducing their commuting time. The white working woman, therefore, is spending more time away from home.

7. A higher wage rate is needed in the SMSA-nonfarm areas to entice a woman there to supply the same number of work hours as a woman in a nonSMSA-nonfarm area. This implies that higher wage rates must be offered in metropolitan-labor markets to increase the supply of labor. Within the nonSMSA categories, it takes a higher wage rate to entice the nonSMSA-nonfarm woman to work as many hours as the nonSMSA-farm woman. Comparing the SMSA-farm and nonSMSA-nonfarm, it seems that these labor markets are comparable in terms of job entry, commuting costs, job information, and so forth.

Income Differential Model

The Model

In the analysis of the unadjusted data a difference in income is noted for the various categories of residence. (See Table IX.) A difference in the occupation or industry mix of the respondents is presumed to explain some of this variance,[1] but to determine the significance of these variables and others in explaining the variance in income, a regression model was employed to arrive at estimated parameters for each of the independent variables. Calculated also were t-values for each independent variable and the R^2-value of the model. The dependent variable was defined to be

INCOME = annual income rate in 1967

The model was set up in two forms, the linear and the logarithmic. The linear, in general form, becomes

$$\text{INCOME} = b_0 + b_1 \text{ HOURS} + b_2D_1 + b_3D_2 + \ldots + b_{n+1}D_n \qquad (6.6)$$

where D_i ($i = 1, \ldots, n$) are the dummy independent variables that correct for personal characteristics of the respondent, occupation or industry, and residence. Hours worked (HOURS) will directly affect income by b_1 times the number of hours. Then, for the dummy variables, when $D_i = 1$, INCOME will increase by an addition of b_{i+1} dollars.

When the logarithmic form is used we arrive at what has been called an "income generating" function. The model is

$$\text{LINCOME} = \log b_0 + b_1 \text{ LHOURS} + b_2D_1 + b_3D_2 + \ldots + b_{n+1}D_n \qquad (6.7)$$

where D_i (i = 1, ..., n) represent the same dummy variables mentioned above. When the antilog of (6.2) is taken, the equation becomes

$$INCOME = b_0 (HOURS^{b_1}) (e^{b_2 D_1}) (e^{b_3 D_2}) \ldots (e^{b_{n+1} D_n}). \quad (6.8)$$

Using this form for the model allows for ease in interpretation. The exponent of HOURS, b_1, is already an elasticity; i.e., if there is a one percent increase in hours worked, income will increase by b_1 percent. If the dummy D_i has a value of zero, INCOME remains unchanged - or is multiplied by a factor of $e^0 = 1$. When $D_i = 1$, however, and all other variables remained unchanged INCOME increases by a factor of $e^{b_{i+1}}$.

As an independent variable in the analysis of yearly income, the hours worked per week enter as an important determinant. The postulated relationship between hours and income is positive.

(1) Hours Worked

HOURS = average number of hours worked per week by the woman in 1967

Some of the variables entered in the form they were defined for the LFP-model. (See Chapter V.) The education variables enter with a similar hypothesis; each increase in educational level results in an increase in the income of the respondent. RACE should affect the analysis such that, all other things being the same, a white woman's income is greater than a non-white woman's income. This may be due to a discriminatory wage rate, uncorrected for in this model. A single woman's income is postulated to be greater than a married woman's income since her marital status has given her a chance to gain more work experience which is usually

accomplished by a higher wage rate than that which a less experienced worker would receive.

In addition to some of the previously defined variables, occupation and industry categories are introduced for the purposes of the income model. They are listed below with brief definitions and the hypotheses behind their entrance into the analysis.

(13) Occupations

FARMERS = 1 respondent indicated she was either a farmer or a farm manager

= 0 otherwise

MANAGER = 1 respondent indicated she was a manager, official or proprietor (not farm)

= 0 otherwise

CLERK = 1 respondent indicated she was a clerical or kindred worker

= 0 otherwise

SALES = 1 respondent indicated she was a sales worker

= 0 otherwise

CRAFTS = 1 respondent indicated she was a craftsman, foreman or kindred worker

= 0 otherwise

OPERATOR = 1 respondent indicated she was an operative or a kindred worker

= 0 otherwise

HOUSE = 1 respondent indicated she was a private household worker

= 0 otherwise

SERVICE = 1 respondent indicated she was a service worker (not private household)

= 0 otherwise

FARMLAB = 1 respondent indicated she was a farm laborer or foreman

= 0 otherwise

LABORER = 1 respondent indicated she was a laborer (not farm or mine)

= 0 otherwise

The hypothesis for the entrance of these variables is to determine if occupation is significant in explaining the variation in income seen in the data. The "base" individual - one for whom all occupation dummies would have values of zero - is the woman who indicated she was a professional, technical or kindred worker. The regression analysis will indicate if a change of occupation from the "base" significantly affects the income of the individual.

(15) Industries

MINE = 1 respondent listed the industry of her work as mining

= 0 otherwise

CONST = 1 respondent listed the industry of her work as construction

= 0 otherwise

MANU = 1 respondent listed the industry of her work as manufacturing

= 0 otherwise

TRANS = 1 respondent listed the industry of her work as transportation, communication and other public utilities

= 0 otherwise

WHOLE = 1 respondent listed the industry of her work as wholesale and retail trade

= 0 otherwise

FINAN = 1 respondent listed the industry of her work as finance, insurance, and real estate

= 0 otherwise

BUS = 1 respondent listed the industry of her work as business and repair services

= 0 otherwise

PERSER = 1 respondent listed the industry of her work as personal services

= 0 otherwise

ENTER = 1 respondent listed the industry of her work as entertainment and recreation services

= 0 otherwise

PROFS = 1 respondent listed the industry of her work as professional and related services

= 0 otherwise

PUBLICA = 1 respondent listed the industry of her work as public administration

= 0 otherwise

These dummies, indicating the industry of the woman's job, were introduced into the INCOME model to see if industry categories proved to significantly influence a woman's income. If all the values of the variables are zeros, it indicates that the respondent's job was in the agriculture, forestry and farming industry.

The residence variables were included in the model in their afore-defined dummy form. The hypothesis of their entrance in the analysis is that place of residence has no significant effect on annual income after adjusting for differences in hours worked, race, education, and occupation or industry. If this is rejected, then residence must be acting as a proxy for such things as lower pay scales for the same kinds of jobs requiring the same training or oversupply of women or for other variations in the labor marker as indicated by FARM, NFARM, and NSFARM.

Results of the Model

General Predictive Ability. The models run in the two forms, linear and logarithmic, are presented in Table XIV. The first and third models are the results of the linear form differing only by the presence of either the occupation or industry variables. The second and fourth models are the results of the logarithmic form.

From Model 1 the 1967 income of a woman in any of the eleven major occupation groupings may be determined. The intercept includes the income of the professional, technical, or kindred worker in a non-SMSA-nonfarm place of residence category. If she is white her income increases by $457.48; if she is a high school graduate her income increases by $278.55; if she works 40 hours per week (the observed average is 34.5) the increase in her yearly income is $40.15.

The signs on the occupation variables indicate that a woman in any other occupation than the "base" earns less and many earn significantly less. Farmers and farm managers earn $2,489.60 less than a professional, technical or kindred worker; managers, officials, and

TABLE XIV

THE INCOME DIFFERENTIAL MODEL CORRECTED FOR OCCUPATIONAL AND INDUSTRIAL DIFFERENCES

VARIABLES	MODEL 1	MODEL 2[a]	VARIABLES	MODEL 3	MODEL 4[a]
HOURS	7.30	.159	HOURS	9.97	.175
	(2.481)**	(9.220)**		(3.441)**	(9.976)**
RACE	457.48	.138	RACE	683.88	.219
	(4.940)**	(6.161)**		(7.510)**	(9.681)**
MS	201.64	.009	MS	168.23	-.001
	(2.248)**	(.422)		(1.858)*	(-.036)
EDUCA	278.55	.088	EDUCA	395.59	.128
	(3.178)**	(4.126)**		(4.641)**	(6.041)**
EDUCB	363.63	.125	EDUCB	486.53	.169
	(4.251)**	(6.002)**		(5.748)**	(8.066)**
EDUCC	2,115.64	.372	EDUCC	2,903.76	.603
	(10.842)**	(7.862)**		(17.980)**	(15.012)**
FARM	369.31	.158	FARM	347.08	.163
	(.845)	(1.495)		(.790)	(1.493)
NFARM	633.87	.213	NFARM	647.04	.218
	(7.321)**	(10.138)**		(7.395)**	(10.024)**
NSFARM	-21.73	-.022	NSFARM	-92.29	-.049
	(-.111)	(-.475)		(-.472)	(-1.004)
OCCUPATIONS			INDUSTRIES		
FARMERS	-2,489.60	-.962	MINE	1,635.30	.581
	(-4.049)**	(-6.447)**		(1.887)*	(2.703)**
MANAGER	-783.76	-.339	CONST	1,068.04	.412
	(-3.150)	(-5.653)**		(2.062)**	(3.206)**
CLERK	-641.37	-.179	MANU	907.99	.363
	(-3.763)**	(-4.326)**		(3.922)**	(6.298)**
SALES	-1,491.87	-.435	TRANS	1,033.23	.337
	(-6.254)**	(-7.519)**		(3.247)**	(4.260)**
CRAFTS	-1,212.14	-.327	WHOLE	138.14	.072
	(-3.140)**	(-3.492)**		(.592)	(1.250)
OPERATOR	-984.38	-.231	FINAN	543.31	.207
	(-5.234)**	(-5.064)**		(1.830)*	(2.813)**
HOUSE	-2,673.52	-.980	BUS	557.24	.203
	(-12.336)**	(-18.660)**		(1.543)	(2.271)**
SERVICE	-1,569.15	-.480	PERSER	-511.46	-.196
	(-8.460)**	(-10.644)**		(-2.199)**	(-3.401)**
FARMLAB	-1,675.79	-.544	ENTER	122.16	.128
	(-5.635)**	(-7.539)**		(.273)	(1.157)
LABORER	-850.20	-.182	PROFS	683.39	.270
	(-1.177)	(-1.040)		(2.948)**	(4.691)**
			PUBLICA	1,478.11	.449
				(5.271)**	(6.441)**
INTERCEPT	3,433.66	7.528	INTERCEPT	1,498.23	6.859
	(15.322)**	(100.372)**		(6.165)**	(86.681)**
R^2	.325	.457	R^2	.313	.423
N	2,304	2,303	N	2,304	2,303

Note: The values in parentheses below the predicted coefficients of the independent variables are the computed t-values for each variable.

[a]This model uses the dependent variable in logarithmic form: log(INCOME).

[b]This variable appears in logarithmic form in this model: log(HOURS).

**Significantly different from zero at the 5% level.

*Significantly different from zero at the 10% level.

proprietors (not farm) earn $783.76 less; clerical and kindred workers earn $641.73 less; sales workers earn $1,491.87 less; craftsmen, foremen, and kindred workers earn $1,212.14 less; operatives and kindred workers earn $984.38 less; private household workers earn $2,673.52 less; service workers (except private household) earn $1,569.15 less; farm laborers and foremen earn $1,675.79 less; and laborers (except farm and mine) earn $850.20 less.

The coefficients of the place of residence dummies indicate some difference in yearly income because of different residences. Both SMSA categories have an increased income - farm, $369.31, and nonfarm, $633.87. The nonSMSA-farm resident earns slightly less ($21.73) than the "base" individual, the nonSMSA-nonfarm resident.

The R^2-value indicates that 32.5 percent of the variation about the mean ($\overline{YINCOME}$) is explained by this model. The number of observations employed is 2,304, those indicating they were at work in 1967.

Interpreting a logarithmic model, Model 4, we see that the elasticity of yearly income with respect to hours worked is .175; i.e., a one percent increase in the number of hours worked will result in a .175 percent increase in yearly income. All the other variables involved, being dummy variables, will cause income to change by a factor. For instance, in this model, the coefficient of RACE indicates that a white woman's income will be 1.24 ($e^{.219}$) times greater than that of a nonwhite woman, all other things remaining the same. (Table XV indicates the remaining multiplicative factors for both Model 2 and Model 4.) The multiple correlation coefficient (R^2) tells us that in

TABLE XV

MULTIPLICATIVE FACTORS IN DETERMINING INCOME DIFFERENTIALS OF THE LOGARITHMIC MODEL

MODEL 2[a]		MODEL 4[b]	
VARIABLES	MULTIPLICATIVE FACTORS	VARIABLES	MULTIPLICATIVE FACTORS
RACE = 1	1.15	RACE = 1	1.24
MS = 1	1.01	MS = 1	.99
EDUCA = 1	1.09	EDUCA = 1	1.14
EDUCB = 1	1.14	EDUCB = 1	1.18
EDUCC = 1	1.45	EDUCC = 1	1.83
FARM = 1	1.17	FARM = 1	1.18
NFARM = 1	1.24	NFARM = 1	1.24
NSFARM = 1	.98	NSFARM = 1	.95
FARMERS = 1	.39	MINE = 1	1.79
MANAGER = 1	.71	CONST = 1	1.51
CLERK = 1	.84	MANU = 1	1.44
SALES = 1	.65	TRANS = 1	1.40
CRAFTS = 1	.72	WHOLE = 1	1.08
OPERATOR = 1	.79	FINAN = 1	1.23
HOUSE = 1	.38	BUS = 1	1.22
SERVIC = 1	..62	PERSER = 1	.82
FARMLAB = 1	.58	ENTER = 1	1.14
LABORER = 1	.83	PROFS = 1	1.31
		PUBLICA = 1	1.57

[a]If a woman is black, resides in a nonSMSA-nonfarm place, non high school, graduate, and works 40 hours per week in a professional, technical or kindred occupation, her expected annual income is $3,348.00. Any other category or groups of categories are the results of the multiplicative factors.

[b]For similar conditions as in footnote a, but for a woman classified in the industry of agriculture, her expected annual income is $1,829.76.

this model 42.3 percent of the variation about the mean ($\overline{\text{LYINCOME}}$) is explained. The number of observations used in estimating this model is 2,303.

Hours Worked. The relationship between hours worked and income is positive, as expected. The linear models indicate that the addition of one hour to the number of hours worked per week will increase yearly income by $7.30 or $9.97, for Model 1 or Model 3, respectively. The addition to yearly income of one hour of working time, assuming there are 50 working weeks in a year, is $.15 or $.20, from the respective models.

This result would seem to indicate that it is the women in low paying occupations or industries who are working the longer hours. To test this hypothesis, models were run with the square term of HOURS included and these seemed to suggest the same thing. A look at the correlation coefficients of HOURS with the occupation or industry variables (Tables XXI and XXII of the Appendix) would seem to corroborate the hypothesis also - the lower income occupations or industries had negative correlation coefficients in relation to hours worked.

From the logarithmic models an estimate of the elasticity of income with respect to hours worked is obtained directly. In Model 2, when the correction is made for the occupations of the respondents, the estimate is .159. This means that when there is a one percent increase in the number of hours worked per week there will be a .159 percent increase in the yearly income of the woman. The estimate from the fourth model, that corrected for the industrial differences of the women, is .175; i.e., if HOURS increases by one percent, YINCOME will increase by .175 percent.

Race. As expected, the models indicate that the income of a white woman is greater than that of a nonwhite woman. In all models, the computed t-values for the predicted coefficient of RACE indicate that it is significantly different from zero at the five percent level.

The dollar increase for the white woman indicated in Model 1 is $457.48 and in Model 3, $683.88. Model 1 is corrected for occupational differences and Model 3 is corrected for industrial differences. The logarithmic models, Model 2 and Model 4, indicate that, all other things the same, the income of a white woman will be greater than that of a nonwhite woman by a factor of 1.15 and 1.24 respectively. Occupational differences are corrected for in Model 2 and Model 4 corrects for industrial differences.

These effects can be viewed as resulting from discrimination against races which would have been more prevalent in 1967 when this data was collected than it would today. This discrimination could be vented either in the form of lower wages to a nonwhite woman with the same qualifications (education and training) as a white woman, or, in an attempt to disguise it, by giving a lower skill position within an occupational or industrial grouping to the nonwhite woman.

Marital Status. In the linear models marital status performs as hypothesized; i.e., the single woman (MS = 1) receives a slightly larger income than the married woman. In Model 1 the coefficient is significantly different from zero at the five percent level and in Model 3 the coefficient is significant at the ten percent level.

In the logarithmic models, however, the variable MS plays a dubious role. In the second model, corrected for occupational differences,

the coefficient indicates that the income of a single woman will be 1.01 times that of a married woman. The fourth model, on the other hand, which corrects for industrial differences indicates that the single woman's income is .99 times that of a married woman, all other things remaining the same. These coefficients have t-values that indicate that the hypotheses that they are equal to zero cannot be rejected for this data. Therefore, the indication from these models is that income and marital status are unrelated.

Education. Each increase in educational level brought about a significant increase in yearly income for the women in the survey. Model 1 indicates increases of $278.55, $363.63, and $2,115.64 for the high school graduate, the woman with some college and/or technical training, and the college graduate, respectively, above the woman with less than a high school education.

The multiplicative factors for the two logarithmic models indicate in Model 2, incomes multiplied by factors of 1.09, 1.14, and 1.45 for each of the educational levels. In the fourth model, the factors are 1.14, 1.18, and 1.83, respectively.

It appears that the woman who invests in a higher educational level will, in general, receive better positions within any occupation or industry category and will be compensated accordingly.

Occupations and Industries. The results in Table XIII suggest that large variations in annual income are contributed by both occupational and industrial categories. Table XVI lists the income of a white married woman with a high school education who lives in a nonSMSA-nonfarm area by occupation and industry. Within the occupational

TABLE XVI

ANNUAL INCOME LEVELS BY OCCUPATION AND INDUSTRY CATEGORIES ADJUSTED FOR SOCIOECONOMIC DIFFERENCES, SAMPLE OF WOMEN AGED 30 TO 44 YEARS, 1967[a]

OCCUPATION	INCOME	INDUSTRY	INCOME
PROF	$4,209.84	AGRIC	$2,632.54
FARMERS	1,720.24	MINE	4,267.84
MANAGER	3,426.08	CONST	3,700.58
CLERK	3,568.47	MANU	3,540.53
SALES	2,717.97	TRANS	3,665.77
CRAFTS	2,997.70	WHOLE	2,770.68
OPERATOR	3,225.46	FINAN	3,175.85
HOUSE	1,536.32	BUS	3,189.78
SERVICE	2,640.69	PERSER	2,121.08
FARMLAB	2,534.05	ENTER	2,754.70
LABORER	3,359.64	PROFS	3,315.93
		PUBLICA	4,110.65

[a]Figures for a white woman who is married with spouse present, has a high school education, is a nonSMSA-nonfarm resident, and works 40 hours per week.

categories, the range is from the low for a private household worker to the high for the professional, technical or kindred worker. The lowest paid of the workers by industrial classification is the woman in the personal services industry, the highest paid in the mining industry. The only variables that contribute as much to the variations in income in fact are a completed college education and race.

Grouping the occupations in terms of low, medium, and high incomes, farmers and farm managers and private household workers fall into the low income group each with an annual income of under $2,400. In the medium income group, with annual incomes in the range $2,400 to $3,300, are the occupations SALES, CRAFTS, OPERATOR, SERVICE, and FARMLAB. The professional, technical or kindred workers, managers, clerks, and laborers occupy the top income bracket with incomes over $3,300.

Making these same types of divisions in the industrial categories, those in the low income group (income under $2,800) are the agriculture, forestry and fisheries, wholesale and retail trade, personal services, and entertainment and recreation services industries. The medium income group with incomes from $2,800 to $3,600 includes the manufacturing, finance, insurance, and real estate, business and repair services, and professional and related services industries. MINE, CONST, TRANS, and PUBLICA fall in the high income industrial group with annual incomes of over $3,600.

It would seem, then, that the types of jobs available in an area play an inportant part in determining the income generating capabilities

of the women residing there. This is of particular concern for rural areas since it is in such areas that the mix of jobs is frequently very limited.

Residence. The implication of the results in terms of residence is that the woman who lives in an SMSA area earns more than the nonSMSA-nonfarm resident. Table XVII shows the differential predicted in the linear model corrected for occupational differences with the annual adjusted income of each place of residence weighted by both own composition mix (the percentage of each occupation in the residence category) and by overall occupation mix (the percentage of each occupation in the sample as a whole). Adjusted incomes show a difference between SMSA-nonfarm and nonSMSA-nonfarm of $684.79 ($3,783.32 - $3,098.53). In percentage terms, the income of a woman in an SMSA-nonfarm area is 82 percent of the income of a woman in an SMSA-nonfarm area. This compares to a difference in cost of living between the two regions of 85 percent.[2] This data indicate that the income differential is greater than the cost of living differential.

Part of this difference is due to the fact that the mix of occupations in nonSMSA-nonfarm areas concentrate those occupations with lower incomes. This contributes to a $40.04 ($3,098.53 - $3,138.57) disadvantage in the nonSMSA-nonfarm areas and to a $60.88 ($3,783.32 - $3,722.44) advantage in SMSA-nonfarm areas.

Looking at the differentials predicted when the industrial differences are taken into consideration (Table XVIII), adjusted incomes show a difference between SMSA-nonfarm and nonSMSA-nonfarm residences of $703.48 ($3,751.57 - $3,048.09). This would indicate that the

TABLE XVII

PREDICTED ANNUAL INCOME DIFFERENTIALS AND ANNUAL ADJUSTED INCOMES WEIGHTED BY OWN MIX AND TOTAL MIX FOR OCCUPATIONS, BY PLACE OF RESIDENCE, 1967

PLACE OF RESIDENCE	ANNUAL INCOME DIFFERENTIAL BY PLACE OF RESIDENCE[a]	ANNUAL ADJUSTED INCOME WEIGHTED BY OWN OCCUPATION MIX[b]	ANNUAL ADJUSTED INCOME WEIGHTED BY OVERALL OCCUPATION MIX[b]
SMSA-farm	+369.31	$3,396.04	$3,507.88
SMSA-nonfarm	+633.87	3,783.22	3,772.44
nonSMSA-farm	- 21.73	2,897.56	3,116.84
nonSMSA-nonfarm	-	3,098.53	3,138.57

[a]From Table XIII

[b]See Table XV for annual adjusted income by occupation and Table X for occupation mix.

TABLE XVIII

PREDICTED ANNUAL INCOME DIFFERENTIALS AND ANNUAL ADJUSTED INCOMES WEIGHTED BY OWN MIX AND TOTAL MIX FOR INDUSTRIES, BY PLACE OF RESIDENCE, 1967

PLACE OF RESIDENCE	ANNUAL INCOME DIFFERENTIAL BY PLACE OF RESIDENCE[a]	ANNUAL ADJUSTED INCOME WEIGHTED BY OWN INDUSTRY MIX[b]	ANNUAL ADJUSTED INCOME WEIGHTED BY OVERALL INDUSTRY MIX[b]
SMSA-farm	+347.08	$3,326.85	$3,425.19
SMSA-nonfarm	+647.04	3,751.57	3,725.15
nonSMSA-farm	- 92.29	2,842.73	2,985.82
nonSMSA-nonfarm	-	3,048.09	3,078.11

[a]From Table XIII.

[b]See Table XV for annual adjusted income by industry and Table XI for industry mix.

nonSMSA-nonfarm income is 81 percent of the SMSA-nonfarm income, comparing unfavorably with the cost of living difference again. Industrial mix differences contribute to a $30.02 disadvantage in the non-SMSA-nonfarm areas and to a $26.42 advantage in the SMSA-nonfarm areas.

Conclusions

The statistical analysis of the yearly income for 1967 of the women surveyed who were at work in that year to explain the variance appearing in the unadjusted data by place of residence allows the following conclusions to be made:

1. The return to yearly income of an additional hour worked is $.15 to $.20. This, along with the correlation coefficients of HOURS with the occupation or industry variables, points up the fact that, within the data, longer hours were worked by those women in the lower paying occupations or industries.

2. The women of the white race were receiving a substantially larger income than the women of the nonwhite races. This would indicate discrimination, either in the form of lower wages or a lower skill position within an occupational or industrial grouping, against a nonwhite woman with the same qualifications (education and training) as a white woman.

3. Marital status can be judged to have only a slight, and oftentimes insignificant, influence on income after corrections are made for hours worked, occupation or industry, education, race, and residence. This conclusion is reassuring to the married woman who may be competing with the single woman who has more time available to devote to working

outside the home, and thus stands to increase her work experience which is premised to lead to higher wage rates. This data does not corroborate this hypothesis.

4. The woman who invests in a higher educational level will, in general, receive better positions within any occupation or industry category and will be compensated accordingly. Model 3, Table XIV, indicates the dollar increases for each educational level to be $395.59 for the high school graduate, $486.53 for the respondent with some college and/or technical training, and $2,903.76 for the college graduate when correction for industry is made.

5. As suspected, occupational or industrial variations contribute much to the large variations in annual income of the working women surveyed. For a white married woman with a high school education who lives in a nonSMSA-nonfarm area, income may range, within the occupational categories, from a low of $1,536.32 for a private household worker to a high of $4,209.84 for a professional, technical or kindred worker. Looking at the industrial categories, the range is from the low of $2,121.08 for a woman in the personal services industry to the high of $4,267.84 for a woman in the mining industry. The implication from this is that the types of jobs available in an area play an important role in the determination of the income generating capabilities of the women residing there.

6. The results of the income differential model imply that the woman living in an SMSA area earns more than the woman ina nonSMSA-nonfarm area. In fact, the data show that the income of a woman in a nonSMSA-nonfarm area is 82 percent of the income of a woman in an

SMSA-nonfarm area. The difference in the cost of living between the two regions is 85 percent as computed for one policy program. Thus, the income differential is greater than the estimated cost of living differential.

FOOTNOTES

[1]See Table XXVII of the Appendix for average income by occupation and place of residence.

[2]Dale Hathaway concluded that "the returns for comparable labor would be about equal if the median income of farm families were 86 percent of nonfarm families." [13, p. 37]

CHAPTER VII

SUMMARY, CONCLUSIONS, AND FURTHER RESEARCH

Summary

The general objectives of this study were to analyze the factors important in a woman's labor force participation decision, with special emphasis on place of residence, and to determine a function for the demand of consumption time for the women surveyed. In Addition, the incomes of the working women surveyed were analyzed to determine the causes of variation. The data employed are the results of the National Longitudinal Surveys taken by the Ohio State University's Center for Human Resource Research of some 5,000 women, 30 to 44 years of age. The data were for 1967, the first year of the five year survey of labor market experience and work attitudes. The sample consisted of 3,606 white women and 1,476 nonwhite women.

Labor Force Participation Model

The analysis of a woman's decision concerning labor force participation is done using a least-squares regression technique with LFP - a dummy variable with a value of unity indicating the woman is in the labor force and a value of zero indicating she is not in the labor force - as the dependent variable. Previous studies guide the choice of factors to include as independent variables - race, marital status,

presence of children, education, family income, work experience, attitudes, and residence. The predicted coefficients indicate the change in the probability of labor force participation if the variables describe the individual in question, with the intercept term capturing the probability for the "base" individual of the model.

The social status variables performed in this model as they had in previous studies. The RACE variable indicated a decrease in the probability of labor force participation if the woman is white. This decrease ranged from .099 to .143 in the models depending on the nature of the other corrections made. When the woman is single (MS = 1) there is an increase in the probability ranging from .088 to .254. FS indicated by its predicted coefficient that as the family size increased by one member the probability of the woman being in the labor force decreased by .030. The presence of young children seems to be a definite deterrent to labor force participation for the woman, with decreases in probability ranging from .145 to .197 within the models presented.

Residence plays a seemingly insignificant role in the labor force participation decision of the woman once corrections are made for other factors. Nevertheless, the models indicate that the woman living in a nonSMSA-nonfarm area is more likely to be in the labor force than a woman residing in any of the three other residence categories. The decrease for the SMSA-farm (FARM) resident varied from .042 to .068, for the SMSA-nonfarm (NFARM) woman from .010 to .051, and for the nonSMSA-farm (NSFARM) resident from .020 to .054. Statistical significance, in general, was lacking to refute the hypothesis of variations in LFP by place of residence.

Of the two measures of work experience used, the total number of years of six-month work seems to influence the likelihood of current labor force participation more so than the years of early work experience. As total work experience (WORK) increases one year the participation probability increases by .004. The range of increase for one additional year of early work experience (EWORK) is from .000391 to .000662.

The attitudinal measures, although performing in exactly the opposite manner expected, produce significant changes in the participation probability of the woman. If the woman had resided in the suburb of a large city or a large city itself at the age of fifteen (WATT = 1) the probability decreases ranging from .033 to .047 within the models. If the woman indicated that her husband liked the idea of her working (HATT = +1), the probability decreases within the range of .371 to .390; if she indicated that he disliked the idea (HATT = -1), the probability increases within that same range.

The family income variables produced results consistent with past studies. As husband's income (HI) increases by $1,000 the probability of the wife being in the labor force will decrease by .0239. As other family income (OFI) increases by $1,000 the accompanying decrease in probability ranges from .00843 to .0105. In the two models presented which indicate whether the family receives public assistance (PUBLIC = 1) or not (PUBLIC = 0), when they do receive it the decrease in participation probability is .031 or .014 depending upon the corrections for other factors in the model.

The educational variables indicate that the more education the woman attains the more likely she is to participate in the labor force.

The increase indicated for the high school graduate (EDUCA = 1) over the woman who has not completed high school varies within the models from .035 to .052. Completing some college and/or taking a technical training course of sorts increases the probability even more so and ranges from .051 to .065. The college graduate (EDUCC = 1) is even more likely to be participating in the labor force. The probability increase, over that of the woman who has not completed high school, varies from .136 to .240.

Supply of Working Time Model

A demand function for the consumption time (time at home) of the women surveyed is formulated based on the theory supplied by Becker [3] which divides time between work activities (time at work) and consumption activities (time at home) as opposed to the classical labor-leisure distinction. His division is particularly applicable in a "household as a decision-making unit" framework.

CHOURS is the dependent variable and is calculated for each woman as 168, the number of hours in a week, minus the time she spends at work, HOURS. For the woman who does not work away from home CHOURS is set equal to 168. Independent variables for the regression analysis include wage rate, commuting time, race, marital status, number or presence of children, other family income, education, and residence. The predicted coefficients indicate the change in the time at home of the woman as these factors apply to her. This function may also be interpreted as a supply function of working time for the women surveyed.

As the wage rate increases it causes a significant decrease in the woman's time spent at home. Within the models, a $1.00 increase in WAGE will cause a decrease in CHOURS varying from 2.73 to 4.44. The squared term of the wage rate (WAGE2) indicates that within the range of our data there is no backward-bending segment in the supply curve of labor.

As other family income increases it increases the time the woman spends in consumption activities. Within the models the predicted coefficient of OFI indicates a $1,000 increase will increase CHOURS within a range from .42 to .51 hours per week. OFI2 (the square term of other family income) was used with insignificant results.

Commuting time, as expected, decreases the consumption time of a woman. Within the models that used it as an independent variable when commuting time to work increases by one minute the range of the decrease in CHOURS is from .485 to 1.031 hours per week. The square term of commuting time (CTIME2) indicates that there is a level of commuting time at which an increase will cause an increase in CHOURS (a decrease in time at work). Analysis of the results indicate this level to be 58 minutes.

The education variables indicate a general decrease in time at home (or an increase in time the woman is willing to supply in the labor market) as the level of education increases. For the high school graduate, the decrease varies from 1.45 to 1.93 hours per week over the "base" individual - a non-high school graduate. The woman with some college and/or technical training will decrease her time at

home, as predicted by the models, within a range of 1.61 to 2.68 hours per week, the college graduate, within a range of 1.94 to 2.73 hours per week.

Young children in the household increase the time the woman spends in the home. When children under six years of age are present this increase varies from 4.37 to 13.47 hours per week. The variable indicating the presence of children in the six to eighteen years age group leads to dubious results. Twice the indication is a small decrease in time at home (.21 and .48 hours) and once a slight increase (.20 hours). Its coefficient is never statistically different from zero. When family members over five years of age are present in the household (ADULTS = 1) there is a significant decrease in the time the woman spends at home. This decrease is approximately 5.9 hours per week in the three models this variable appears.

When the actual number of children in the two age groups is used, an estimate of the change in CHOURS for the addition of one child is obtained. The predicted increase for an additional child in the under six years age group ranged from 2.21 to 4.56 hours per week. An additional child in the older age group, six to eighteen years, increases the time of a woman at home, also, but by a smaller amount. Variation within the models is .58 to 1.07 hours per week.

When the race of the woman is corrected for in the models, the results prove to be interesting. In the models uncorrected for commuting time, the predicted coefficient of RACE indicates that a white woman spends more time at home than a nonwhite woman, the time increase varying from 1.83 to 2.95 hours per week. When commuting time is present in the model, however, the indication is that a white woman

spends less time at home than a nonwhite woman. This decrease ranges from .42 to 2.36 hours per week.

"Single" women - those never-married, separated, widowed, divorced, or married with husband absent - are willing to supply more time in the labor force than married women. The range of the increase in time supplied in the labor market (decrease in time spent at home) is from 1.85 to 4.32 hours per week.

A woman whose family receives some type of public assistance spends more time at home. In the two models in which PUBLIC is included, it increases CHOURS by .88 and 1.35 hours per week. The effect of this variable will be especially important in the families with low incomes since it is the case that these families are more likely to be receiving public assistance.

The residence variables indicate the difference in consumption time of a woman in an SMSA-farm area or an SMSA-nonfarm area or a nonSMSA-farm area when compared to the consumption time of a woman in a nonSMSA-nonfarm area. The coefficient of FARM indicates that a woman in an SMSA-farm area spends slightly less time at home than a nonSMSA-nonfarm woman in four of the five models that correct for residence. None of these coefficients can be said to be significantly different from zero, however. The SMSA-nonfarm woman spends significantly more time at home than the nonSMSA-nonfarm woman. In the model uncorrected for commuting time in which the residence variables appear the increase is only .62 hours. In the models corrected for both commuting time and residence the increase in CHOURS when NFARM = 1 varies from 1.44 to 2.50 hours per week. In all but one of the models the indication is that the nonSMSA-farm woman spends slightly less time

at home, but, again, none of the coefficients can be said to be significantly different from zero. The SMSA-central city dweller, in the one model in which CC appears, is indicated to spend slightly more time at home, .935 hours per week, but this coefficient cannot be said to be significantly different from zero.

Income Differential Model

In the analysis of the incomes of the working women, the income rate for 1967 is used as the dependent variable. As independent variables, hours at work per week, race, marital status, education, residence, and occupation or industry are employed. This model is formulated in both linear and logarithmic forms. The predicted coefficients in the linear model indicate changes arising in the dollar amount of yearly income as a result of changes in the independent variables. The logarithmic formulation permits interpretation of the coefficients of the variables that are actual values directly as elasticities and of the dummy variables as multiplicative factors that affect the yearly income amount as one of these attains the value of unity and all others remain unchanged.

The results of the linear models with regard to the variable HOURS, hours worked per week, point out an interesting phenomenon occurring within the data. The model corrected for occupations indicates that an extra hour worked in a year will increase yearly income by $.15 and the model in which industries are corrected for an extra hour will bring an increase of $.20. This seems to suggest that women with the lowest pay scales in each of the occupations and industries are working the longest hours. From the logarithmic models,

the estimate of the elasticity of income with respect to hours worked is .159 in the model with occupational corrections and .175 in the model with industrial corrections.

RACE performed such that the income of a white woman is larger than that of a nonwhite woman. The linear models showed the increase to be either $457.48 or $683.33. In the logarithmic models, the indication is that the white woman's income is either 1.15 or 1.24 times that of a nonwhite woman.

The marital status variable played a dubious role in the YINCOME model. In the linear model the results suggest a statistically significant increase in annual income if the woman is single - either $201.64 or $168.23. The coefficients of the logarithmic models, however, in one case indicate a multiplicative factor of 1.01 and, in the other, .99. Neither of these can be said to be significantly different from zero.

An increasing educational level increases the yearly income of the individual even when correcting for occupation or industries of employment. The dollar amounts predicted in the linear models are, for a high school graduate over a woman with less education, $278.55 or $395.59, for a woman with some college and/or technical training over a woman with less than a high school education, $363.63 or $486.53, and for the college graduate, $2,115.64 or $2,903.76. The multiplicative factors from the logarithmic models are, for the high school graduate 1.09 or 1.14, for the woman with some college and/or technical training 1.14 or 1.18, and for the college graduate 1.45 or 1.83. These factors are all in regard to the income of a woman with less than a high school education.

SMSA residents have larger incomes than nonSMSA residents, all other things the same, according to the results of the income differential model. When compared to a nonSMSA-nonfarm resident, an SMSA-farm resident earns, in dollar amounts, $369.31 or $347.08 more; in multiplicative factor terms, either 1.17 or 1.18 times that of a nonSMSA-nonfarm woman. Making the same comparison for an SMSA-nonfarm dweller, the predicted increase is $633.87 or $647.04 or, in multiplicative factor terms, 1.24 or 1.24 (both models here predict the same factor) times that of a nonSMSA-nonfarm resident. The nonSMSA-farm woman earns slightly less than her counterpart in the nonSMSA-nonfarm area. The predicted dollar decrease is either $21.73 or $92.29 if the model is corrected for occupational differences of industrial differences. The logarithmic models indicate the nonSMSA-farm woman's income to be either .98 or .95 times that of the nonSMSA-nonfarm woman.

Within the occupations, the farmers and farm managers and private household workers are shown to be the lowest paid, with professional, technical, and kindred workers the highest paid. The decrease in income for FARMERS is $2,489.60 - or they earn .39 times the income of a professional, technical, and kindred worker. For HOUSE the dollar decrease is predicted to be $2,673.52, the multiplicative factor .38.

The highest paid worker, in terms of industry of employment, is the woman in the mining industry whose income is $1,635.30 more than that of a woman in agriculture. The lowest paid is the woman in the personal services industry whose annual income is $511.46 less than that of the woman in agriculture. From the logarithmic model, the mine worker's income is 1.79 times that of the woman in agriculture

and the woman in the personal services industry earns .82 times that of the woman in agriculture.

Conclusions

Labor Force Participation

Trends. More women are working today than ever before. This rise in female participation is all-pervasive, encompassing both the young and old, married and single. The participation rates and worklife pattern of single women, and those women who are widowed, divorced or separated, observe patterns that are quite different from those of married women, however. Changes in the rates in the past three decades have been much more pronounced for married women, particularly older married women. In analyzing the factors behind the participation of women, a special interest must be placed upon those accounting for the increased labor force activity of married women.

Husband's income is judged to play the most influential role in a wife's labor force decision. It has been shown, though, that while husbands' earnings have been rising, wives' earning potentials have been rising also [24]. In fact, the positive correlation of the wives' desire to work with their own potential earnings has more than offset the negative impact of their husbands' higher incomes, with the result that increasing proportions of wives have joined the labor force each year. Cain [6] found that at all income levels of husbands, larger percentages of wives worked in 1960 than in 1951, but the biggest increase occurred among those wives whose husbands were in the $3,000 to $10,000 range, and particularly the $7,000 to $10,000 bracket.

It has been suggested that perhaps the best explanation for the overall increase in female labor force participation in recent years is the increase in demand for female workers which, has, in turn, stimulated an increase in the supply of women in the labor market [27]. This rising demand could be attributed to a large extent to a rise in the demand for workers in typically female occupations - clerical work and several occupations in the professional and service categories.

The female labor force, indeed, is what one might term "super-typical of the general trends exhibited by male workers" [27]. The type of industrial composition that employed males have been approaching is one that was earlier characteristic of the female labor force. The proportion of females employed in agriculture, for example, was already under five percent in 1940, while 24 percent of males were still in this category. Furthermore, the growing tendency of male workers to concentrate in service industries was already typical of women in 1940. Since 1940, and probably for some years before, a large majority of female workers have been concentrated in this sector, while hardly 50 percent of employed males in 1960 were in service industries. The major difference in the occupational trends between the sexes is that some of the tendencies observed for male and female workers combined seem to have started earlier for women and, in addition, to have been more pronounced for women in several cases.

The trends exhibited by the female workers in industry and occupation classifications are important when viewing the labor force as a whole. It seems that these will forecast the trends that will soon appear in the participation of male workers in the broad categories, at least.

Social Factors. The findings of this study corroborate those of past studies in regard to the relationship between the race and the labor force status of a woman. If she is white, she is less likely to be in the labor force. The nonwhite woman is more often supporting herself or augmenting the family income which is probably quite small in the first place.

The single woman is more likely to be in the labor force than the married woman with spouse present. This may be due to fewer home responsibilities for the single woman or the need to support herself and any dependents she may have.

As the size of the family increases the probability of the woman being a member of the labor force decreases. This indicates that an increasing number of household members increases the home responsibilities of the woman thereby decreasing the likelihood of her working outside the home. This decrease in probability is less than the decrease resulting from the presence of children under six years of age in the household.

The presence of young children decreases the probability of a respondent's presence in the labor force. The decrease is large enough to outweigh the increase in probability due to the attainment of any educational level from high school graduate and beyond.

The attainment of a higher educational level by a woman would seem to be an indication that she will be more likely to participate in the labor force than the woman who has failed to complete high school. Attaining a higher level of education may signify an already strong desire on the woman's part to be active in the labor force and that she

is becoming better educated to promote that end. The results of this study suggest this, and in doing so, concur with past studies' findings.

The attitudinal variables did not perfrom as expected. The crudeness of the measures in the case of both the woman's attitude toward work and the husband's attitude toward his wife working may have greatly influenced their performance. As a proxy for the woman's attitude, her place of residence at 15 is used. Place of residence, it appears, cannot indicate a person's attitudes or perhaps attitudes are arrived at after the age of fifteen. The woman was asked to indicate her husband's views toward her working and this may have caused a bias to enter into the measure of husband's attitude.

Economic Factors. Work experience is seen to be a major influence in the labor force status of a woman. Recent labor force participation significantly increases the probability of participation as opposed to early work experience. For the age group studied, 30 to 44 years, this suggests that reentry into the labor force is a major problem.

Husband's income is seen to be an extremely influential variable in this study as it has in previous studies. An increase in his income will decrease the probability of his wife being in the labor force. It seems that a significant percentage of the working wives are primarily in the labor force to augment family income and will leave the labor market when their income is not needed any longer.

When other family income, the income of all family members excluding the woman, increases the probability of the woman being in the

labor force decreases. This decrease is not as large as the decrease in probability caused by an increase in the husband's income.

The receipt of public assistance by a family member leads to a decrease in the woman's participation probability. This effect would be exhibited particularly at the lower levels of family income since the families with low incomes are more likely to be receiving public assistance of some kind.

Residence. The metropolitan labor market with its attractions of more jobs, information, and opportunities and shorter commuting distances would seemingly cause a resident of such an area to be more likely to be in the labor force. The findings of this study could not allow this conclusion. In fact, when corrections are made for income levels, educational levels, family size, and work experience, place of residence is found to be insignificant. It seems that place of residence in this study, and many of the studies of the past, does not significantly influence the woman's labor force participation decision.

Supply of Working Time

Wage Rates. In accordance with economic theory, as the wage rate increases the time the women in this study are willing to supply in the labor market increases. However, within the range of this data there is no backward-bending segment of the supply curve as generally hypothesized in a labor-leisure analysis of time and its allocation. An estimate of the elasticity, in fact, indicates that a one percent increase in the wage from its mean will lead to a .25 percent decrease in time at home or a .25 percent increase in time available for work

outside the home. Indeed, the mean wage rate of the employed women in this study is so low, $.87, that it is understandable that increasing it would increase the time a woman is willing to work away from home.

Family Income. As the income of other family members increases, the time the woman spends at home increases. If any family member is receiving some type of public assistance there is an increase in the consumption time of the woman.

Considering the interaction of the wage rate and other family income, at a given wage rate as other family income increases, consumption time of the woman increases (supply of working time decreases). At higher wage rates, moreover, the time at home increases at a faster rate as other family income increases. This, again, brings up the point that the woman is primarily in the labor force to augment the family's income. It would seem that when her income is no longer necessary to attain a certain standard of living, she will supply less time in the labor force no matter how the market may try to entice her to continue supplying the same number of hours if not more.

Commuting Time. Initially, there is a positive relationship between commuting time and hours offered in the labor market. This is expected since virtually all jobs require some amount of commuting time. The data of this study demonstrate the existence of a level that actually discourages women from supplying more time at work - 58 minutes. Beyond this level a woman will choose to forego the extra income that could be earned, but she is also getting away from having

to pay the extra price of the additional time spent in commuting whether it be for additional gas, bus fare, or commuter train fare.

The wage rate, though, when it increases can change a woman's mind about the upper limit of commuting time to which she will agree. At any rate, at higher wage rates, the reduction in commuting time becomes less important in the determination of the time she will spend in the labor market.

Education. The premise that education increases the efficiency of the woman in home production activities as set down in the theory is corroborated by the results of this study. It has been suggested, also, that education may have additional effects on the supply of working time by creating skills for analyzing and interpreting information, including the evaluation of job opportunities, thereby improving allocative efficiency [16]. The empirical results imply that the woman with more years of formal education is willing to supply more time in the labor market.

Family Members. Children in the household are a definite deterrent to the woman working outside the home. Young children, especially increase the demand for the woman's time in the home. When there are other adults in the household, their presence alleviates this demand to some extent as they help perform duties she would normally do by herself.

Race. The results of this study indicate that a white woman spends more time away from home. It seems that no matter where jobs are available, metropolitan or nonmetropolitan areas, the nonwhites

live closer to them, reducing their commuting time. White families, as is evidenced in the United States, usually seek to locate in some area remote from the central business district of a community or the industrial complex of the area. As a result, they must spend more time in commuting to their jobs than many of the nonwhites who choose to live closer in.

Marital Status. Single women are willing to supply more time in the labor market than married women with husband present in the household. If the woman has never married, fewer home responsibilities may lead her to giving up more time at home. If she is the head of the household with other family members depending upon her for support she may supply more time at work to satisfy these demands. This result is consistent with prior findings.

Residence. The results of this study indicate that a higher wage rate is needed in the SMSA-nonfarm areas to entice a woman residing there to supply the same number of work hours as a woman in a nonSMSA-nonfarm area. Indeed, looking at the predicted equation of Model 9, Table XIII, adjusted so that hours at work is the dependent variable.

$$\begin{aligned} HOURS = c &+ 3.793\ WAGE - .005\ WAGE2 - .000150\ (WAGE)(OFI) \\ &- .026\ (WAGE)(CTIME) - 2.505\ NFARM + .094\ (WAGE)(NFARM) \end{aligned} \tag{7.1}$$

Evaluating this at $\overline{OFI}$ = \$4,972.67 and $\overline{CTIME}$ = 9.964 minutes, (7.1) becomes

$$HOURS = c + 2.788\ WAGE - .005\ WAGE2 - 2.505\ NFARM + .094(WAGE)(NFARM) \tag{7.2}$$

To find the change in the wage rate for a change in residence from the "base" (nonSMSA-nonfarm) it is necessary to take the partial derivatives, so that

$$\frac{d\ WAGE}{d\ NFARM} = -\frac{\frac{\partial\ HOURS}{\partial\ NFARM}}{\frac{\partial\ HOURS}{\partial\ WAGE}} = -\frac{-2.505 + .094\ WAGE}{2.788 - .010\ WAGE + .094\ NFARM} \quad (7.3)$$

If the wage rate is set at \$1.00, evaluating $\frac{d\ WAGE}{d\ NFARM}$ indicates that residents of SMSA-nonfarm areas must be paid \$.87 more than nonSMSA-nonfarm residents to encourage them to supply the same number of work hours.

As the overall wage rate increases, however, this differential decreases. For instance, increasing WAGE to \$2.00 and evaluating (7.3) the differential to entice the SMSA-nonfarm women to maintain the same number of work hours as nonSMSA-nonfarm women decreases to \$.84.

This phenomenon is observed in metropolitan labor markets across the United States where higher wages must be offered to increase the supply of labor in the area. Indeed, if jobs in large metropolitan areas are to be filled with competent individuals, the wages for these jobs must always be higher than jobs of a similar nature in other locations to attract the kind of individuals desired.

The results also indicate that a higher wage rate must be offered the nonSMSA-nonfarm women to encourage them to supply the same amount of work hours as the nonSMSA-farm women. Comparing the SMSA-farm and nonSMSA-nonfarm areas it seems that these labor markets are comparable in terms of job entry, commuting costs, job information, and so forth.

Income Differentials

Hours Worked. For the data used in this study the results indicate that women in the low paying occupations or industries are working longer hours than any of the other women. The addition to yearly income for an increase of one work hour during the year is quite low as a result, $.15 to $.20.

Perhaps in these low paying occupations or industries part-time arrangements cannot be made with the employer so that the number of hours worked per week is set at an arbitrary figure, say 40, when the woman is employed and cannot be changed short of quitting and reducing work time to zero. It might also be the case that women in such jobs lack the skills to shift into some other line of work where hours are more flexible, and profitable.

Race. Discrimination in the form of lower wages or a lower skill position within an occupational or industrial grouping against a nonwhite woman with the same qualifications (education and training) as a white woman is implied in the results of this study. Realizing that 1967 data are involved, if more recent figures were available it is hoped that the same type of analysis would show a less significant difference in incomes by race.

Marital Status. The single woman supplying more time at work outside the home has the chance to gain more work experience than the married woman, and thus, command a higher wage rate. The results of this study, nevertheless, indicate no significant difference in yearly income by marital status.

Education. The woman who invests in higher education will receive better positions within any occupation or industry category and will be compensated accordingly. The results indicate that the opportunity cost of attaining a college education will be made up for within a few years simply with the income increase resulting from attaining that level of formal education.

Occupations and Industries. Occupations and industries play a large role in explaining the variations in yearly income. Thus, the types of jobs available in an area play an important role in the determination of the income generating capabilities of the women residing there.

Residence. The results of this study suggest that the woman living in an SMSA area earns more than the woman in a nonSMSA-nonfarm area. The data show that the income of a woman in a nonSMSA-nonfarm area is 82 percent of the income of a woman in an SMSA-nonfarm area. The difference in the cost of living between the two regions is 85 percent as computed for one policy program [13]. The income differential arising in these data is greater than the estimated cost of living differential.

If the occupational and industrial-mix in the nonmetropolitan areas would change so that more of the higher paying jobs were available in these areas, more women would seek out such jobs, and the difference in the income and cost of living differentials would decrease, and, hopefully, disappear.

Further Research

Since the data for this study were collected, our society's attitudes toward women have been changing. The women's liberation movement, the Equal Rights Amendment, and equal opportunity employment have all become subjects for living room discussions in recent years. Some women may have pushed women's "lib" a little too far, but it cannot be argued that opportunities for women have increased as a result of their efforts.

The results of this study of 1967 data along with the results in the later years of the National Longitudinal Surveys of this same group of women could be analyzed to determine if society has an influence, over the years, on the labor force decision of a woman and the time she is willing to supply in the labor market. An analysis of the younger age group of women surveyed, those 14 to 24 years of age, might show that society's attitudes exert a stronger influence upon the labor force activity of these women, under the premise that young people are more easily swayed by their peer group.

Despite the similar participation rates for the different residence categories this study indicates that women in certain areas are willing to supply the same amount of work time for lower wage rates than women in other areas. Industries seeking areas where lower wages may be paid should be influenced by these results and determine the feasibility of locating in these areas.

There is nothing in this study to indicate what the marginal value product of labor by residence may be for women in the 30 to 44

age group. An investigation to determine this would aid in deciding if the lower wage rates in certain residence categories are conducive to future expansion of industries and businesses.

Indeed, if the lower wage rates required in some areas for the same supply of work time on the part of the women residents do attract industry to these areas, the income generating capabilities of these women will change. The direction of change will depend upon the pay scale of the industry. This change may serve to either increase or decrease the difference between the income differentials and cost of living idfferentials already existing between the residence areas.

Interesting, also, would be to see the effect of time and societal values on the occupational/industrial distribution of these women and the occupational/industrial distribution of the first major choice of the younger women. Is society really drifting away from its sex-delineated occupations and industries?

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APPENDIX

TABLES

TABLE XIX

SIMPLE STATISTICS FOR VARIABLES IN ALL MODELS

VARIABLES	NUMBER	MEAN	STANDARD DEVIATION	SUM
RACE	5,083	.709	.454	3,606
MS	5,083	.200	.400	1,019
FS	5,083	4.764	2.211	24,216
CHILD	5,083	.821	.383	4,173
CHILD2	5,083	.746	.435	3,791
NCHILD	5,083	.442	.759	2,249
NCHILD2	5,083	1.644	1.493	8,355
FARM	5,083	.008	.092	43
NFARM	5,083	.637	.481	3,236
NSFARM	5,083	.054	.225	273
WORK	5,083	13.555	23.562	68,900
EWORK	5,082	8.490	22.081	43,144
WATT	5,083	.383	.486	1,948
HATT	5,083	.760	.575	3,864
HI	4,281	5,499.33	4,562.07	23,542,634
OFI	5,083	4,972.67	4,721.72	25,276,092
PUBLIC	5,083	.306	.461	1,554
EDUCA	5,083	.422	.494	2,144
EDUCB	5,083	.360	.480	1,828
EDUCC	5,083	.078	.268	396
CC	5,083	.335	.472	1,702
CHOURS	5,083	152.076	19.756	773,002
HOURS	2,343	34.546	14.260	80,942
CTIME	4,998	9.964	15.714	49,800
LFP	5,082	.525	.499	2,670
WAGE	5,083	.53	9.187	2,693.83

TABLE XX

SIMPLE CORRELATION COEFFICIENTS FOR
VARIABLES IN LFP MODELS

VARIABLES	RACE	MS	FS	CHILD	FARM	NFARM	NSFARM	WORK	EWORK	WATT	HATT	HI	OFI	PUBLIC	EDUCA	EDUCB	EDUCC	LFP
RACE	1.0000																	
MS	-.2477	1.0000																
FS	-.1719	-.1902	1.0000															
CHILD	.0673	-.3763	.5063	1.0000														
FARM	.0118	-.0355	.0370	.0095	1.0000													
NFARM	-.0718	.0769	-.1194	-.0797	-.1223	1.0000												
NSFARM	.0218	-.0517	.0992	.0475	-.0220	-.3153	1.0000											
WORK	-.0290	.0265	-.0171	.0428	-.0076	.0095	-.0166	1.0000										
EWORK	.0194	.0199	-.0111	-.0209	.0239	.0070	-.0182	.4620	1.0000									
WATT	.0098	.0409	-.0603	-.0266	-.0330	.3717	-.1573	.0013	-.0126	1.0000								
HATT	.0126	.2087	.0268	-.0189	.0012	-.0398	.0219	.0034	.0012	-.1767	1.0000							
HI	.3887	-.6738	.0585	.3036	-.0049	.1051	-.1171	-.0230	.0130	.0969	.3744	1.0000						
OFI	.2797	-.4625	.0601	.2155	-.0237	.1362	-.1582	-.0093	.0245	.0969	-.0572	.9670	1.0000					
PUBLIC	-.1189	.3183	.0710	-.0388	-.0007	-.0038	-.0160	-.0188	.0094	.0171	.0354	-.2905	-.1837	1.0000				
EDUCA	.1781	-.0814	-.0561	.0487	.0124	.0373	-.0162	.0222	.0364	.0732	-.0075	.1486	.1093	-.0609	1.0000			
EDUCB	.0814	-.0087	-.0962	.0179	-.0066	.1102	-.0712	.0255	-.0205	.1328	-.0076	.1501	.1324	-.0168	.0464	1.0000		
EDUCC	.0583	-.0044	-.0795	-.0385	-.0188	.0212	-.0204	.0289	.0009	.0441	.0523	.1255	.0850	-.0941	-.2483	-.0649	1.0000	
LFP	-.1506	.1941	-.1084	-.2013	-.0111	.0036	-.0182	.2164	.0205	-.0344	-.0634	-.3015	-.1753	-.0813	-.0219	.0330	.0587	1.0000

TABLE XXI

SIMPLE CORRELATION COEFFICIENTS FOR VARIABLES IN THE YINCOME MODEL CORRECTED FOR OCCUPATIONS

VARIABLES	RACE	MS	HOURS	YINCOME	FARMER	MANAGE	CLERK	SALES	CRAFT	OPERAT	HOUSE	SERVIC	FARLAB	LABOR	EDUCA	EDUCB	EDUCC	FARM	NFARM	NSFARM
RACE	1.0000																			
MS	-.1533	1.0000																		
HOURS	.0555	.1327	1.0000																	
YINCOME	.2032	.1357	.3217	1.0000																
FARMER	-.0086	.0142	.0178	-.0429	1.0000															
MANAGE	.1067	-.0180	.1107	.0889	-.0055	1.0000														
CLERK	.2709	-.0302	.0101	.2151	-.0208	-.1114	1.0000													
SALES	.0771	-.0362	-.0625	-.0736	-.-069	-.0370	-.1392	1.0000												
CRAFT	.0523	-.0171	.0182	-.0035	-.0037	-.0200	-.0753	-.0250	1.0000											
OPERAT	.0067	.0104	.0560	.0004	-.0160	-.0857	-.3224	-.1071	-.0579	1.0000										
HOUSE	-.3686	.0764	-.2252	-.3231	-.0112	-.0600	-.2257	-.0749	-.0406	-.1736	1.0000									
SERVIC	-.1765	.0092	.0983	-.1924	-.0148	-.0794	-.2988	-.0992	-.0537	-.2299	-.1609	1.0000								
FARLAB	-.0639	-.0159	-.0660	-.1359	-.0042	-.0226	-.0850	-.0282	-.0153	-.0654	-.0458	-.0606	1.0000							
LABOR	-.0340	.0043	-.0132	-.0164	-.0018	-.0096	-.0360	-.0120	-.0065	-.0277	-.0194	-.0257	-.0073	1.0000						
EDUCA	.1965	-.0612	.0525	.0819	.0054	.0663	.3407	.0666	-.0167	-.0741	-.1876	-.0674	-.0949	-.0282	1.0000					
EDUCB	.0732	.0214	.0438	.2016	-.0254	.0341	.2179	.0042	-.0094	-.1408	-.1778	-.0081	-.0877	-.0060	.0744	1.0000				
EDUCC	.0259	.0165	.0388	.3267	-.0096	-.0293	-.1003	-.0555	-.0349	-.1495	-.1047	-.1239	-.0394	-.0167	-.2540	-.0693	1.0000			
FARM	.0368	-.0534	-.0299	-.0234	-.0026	-.0141	-.0116	-.0176	-.0095	-.0092	-.0083	.0284	.0381	-.0046	.0458	-.0261	-.0017	1.0000		
NFARM	-.0482	.0888	.0358	.2187	-.0100	.0301	.0802	.0273	-.0175	-.0432	-.0376	.0089	-.1201	-.0367	.0071	.1389	.0061	-.1114	1.0000	
NSFARM	-.0137	-.0527	-.0087	-.0939	-.0067	-.0361	-. 460	-.0077	.0424	-.0275	.0338	-.0296	.1904	-.0116	-.0270	-.0611	.0206	-.0172	-.2849	1.0000

TABLE XXII

SIMPLE CORRELATION COEFFICIENTS FOR VARIABLES IN THE YINCOME MODEL CORRECTED FOR INDUSTRIES

VARIABLES	RACE	MS	HOURS	YINCOME	MINE	CONST	MANU	TRANS	WHOLE	FINAN	BUS	PERSER	ENTER	PROFS	PUBLICA	EDUCA	EDUCB	EDUCC	FARM	NFARM	NSFARM
RACE	1.0000																				
MS	-.1533	1.0000																			
HOURS	.0555	.1327	1.0000																		
YINCOME	.2032	.1357	.3217	1.0000																	
MINE	.0114	.0448	-.0233	.0226	1.0000																
CONST	.0469	-.0369	-.0290	.0023	-.0036	1.0000															
MANU	.1702	.0135	.0838	.1291	-.0243	-.0421	1.0000														
TRANS	.0908	-.0030	.0284	.1162	-.0082	-.0143	-.0970	1.0000													
WHOLE	.1029	-.0232	.0460	-.1147	-.0209	-.0364	-.2469	-.0837	1.0000												
FINAN	.0870	-.0129	.0262	.1090	-.0088	-.0153	-.1040	-.0353	-.0898	1.0000											
BUS	.0293	.0075	-.0474	.0017	-.0060	-.0105	-.0713	-.0242	-.0615	-.0259	1.0000										
PERSER	-.3817	.0789	-.1593	-.3324	-.0204	-.0354	-.2407	-.0816	-.2078	-.0876	-.0600	1.0000									
ENTER	.0408	-.0160	.0422	-.0242	-.0044	-.0076	-.0517	-.0175	-.0446	-.0188	-.0129	-.0435	1.0000								
PROFS	-.0029	-.0435	.0293	.1384	-.0264	-.0458	-.3114	-.1056	-.2688	-.1133	-.0776	-.2621	-.0562	1.0000							
PUBLICA	-.0210	.0001	-.0014	.1481	-.0108	-.0187	-.1270	-.0431	-.1096	-.0462	-.0317	-.1069	-.0229	-.1383	1.0000						
EDUCA	.1965	-.0612	.0525	.0819	.0306	.0665	.0236	.0839	.0968	.1022	.0383	-.1775	.0162	.0757	.0678	1.0000					
EDUCB	.0732	.0214	.0438	.2016	.0106	.0185	-.0762	.0786	-.0358	.0823	.0635	-.1621	.0006	.1088	.1262	.0744	1.0000				
EDUCC	.0259	.0165	.0388	.3267	-.0136	-.0236	-.1202	-.0332	-.1043	-.0584	-.0116	-.1202	.0100	.3612	.0199	-.2540	-.0693	1.0000			
FARM	.0368	-.0534	-.0299	-.0234	-.0037	-.0064	-.0135	-.0149	.0119	-.0160	-.0109	-.0032	-.0079	.0103	.0086	.0458	-.0261	-.0017	1.0000		
NFARM	-.0482	.0883	.0358	.2187	-.0141	.0030	-.0333	.0293	.0626	.0571	.0488	-.0482	.0036	.0005	.0169	.0071	.1389	.0061	-.1114	1.0000	
NSFARM	-.0137	-.0527	-.0087	-.0939	-.0095	-.0165	-.0260	-.0235	-.0565	.0001	-.0280	.0149	.0065	.0073	.0184	-.0270	-.0611	-.0206	-.0172	-.2849	1.0000

TABLE XXIII

SIMPLE CORRELATION COEFFICIENTS FOR VARIABLES IN THE CHOURS MODELS

VARIABLES	RACE	MS	CHILD	CHILD2	NCHILD	NCHILD2	FARM	NFARM	NSFARM	OFI	OFI2	EDUCA	EDUCB	EDUCC	PUBLIC	CC	CTIME	CTIME2	WAGE	WAGE2	CHOURS	HOURS	WOFI	WCTIME	OCTIME	WFARM	WNFARM	WNSFA
RACE	1.0000																											
MS	-.2477	1.0000																										
CHILD	.0673	-.3763	1.0000																									
CHILD2	.0374	-.2900	.7799	1.0000																								
NCHILD	-.0694	-.1146	.2723	.1118	1.0000																							
NCHILD2	-.1269	-.1573	.4757	.6428	.1781	1.0000																						
FARM	.0118	-.0355	.0095	.0095	-.0001	.0307	1.0000																					
NFARM	-.0718	.0769	-.0797	-.0850	-.0301	-.1003	-.1223	1.0000																				
NSFARM	.0218	-.0517	.0475	.0449	.0083	.0902	-.0220	-.3153	1.0000																			
OFI	.2797	-.4625	.2155	.1574	.0270	.0332	-.0237	.1362	-.1582	1.0000																		
OFI2	.2378	-.2906	.1508	.1128	.0129	.0188	-.0252	.1276	-.1124	.8950	1.0000																	
EDUCA	.1781	-.0814	.0487	.0302	-.0092	-.0363	.0124	.0373	-.0162	.1093	.0773	1.0000																
EDUCB	.0814	-.0087	-.0179	-.0239	-.0307	-.0666	-.0066	.1102	-.0712	.1324	.1368	.0464	1.0000															
EDUCC	.0583	-.0044	-.0385	-.0545	.0085	-.0865	-.0188	.0212	-.0204	.0850	.1200	-.0248	-.0649	1.0000														
PUBLIC	-.1189	.3183	-.0388	-.0108	-.0228	.0437	-.0007	-.0038	-.0160	-.1837	-.1434	-.0609	-.0168	-.0941	1.0000													
CC	-.3135	.1789	-.1254	-.0980	-.0231	-.0560	-.0428	.5317	-.1690	-.0869	-.0664	-.0354	.0286	-.0040	.0486	1.0000												
CTIME	-.2473	.2112	-.1893	-.1579	.1635	-.1051	-.0239	.1079	-.0460	-.1581	-.1450	-.0288	.0184	-.0042	.0509	.1675	1.0000											
CTIME2	-.1642	.1260	-.0982	-.0911	-.0694	-.0593	-.0161	.0649	-.0301	-.0936	-.0842	-.0102	-.0038	-.0183	.0373	.1174	.8251	1.0000										
WAGE	-.0199	-.0031	-.0003	.0045	.0370	-.0103	-.0006	-.0188	-.0070	-.0139	-.0091	-.0109	-.0091	.0019	.0224	-.0111	.0269	.0074	1.0000									
WAGE2	-.0219	-.0070	.0066	.0082	.0473	-.0060	-.0013	-.0186	-.0034	-.0141	-.0087	-.0120	-.0106	-.0038	.0212	-.0101	.0045	-.0015	.9923	1.0000								
CHOURS	.0835	-.1974	.2204	.1700	.2193	.1385	.0021	.0001	.0019	.1742	.1565	-.0105	-.0485	-.0234	-.0245	-.0439	-.4630	-.2020	-.0362	-.0030	1.0000							
HOURS	.0412	.1475	-.1518	-.1435	-.1112	-.1468	.0029	.0226	-.0588	-.0941	-.0771	.0196	.0454	.0604	.0270	.0373	.0231	-.0066	-.0373	-.0214	-1.0000	1.0000						
WOFI	.0459	-.0791	.0130	.0198	-.0127	-.0134	-.0010	.0035	-.0320	.1661	.1467	.0195	.0114	.0272	-.0251	-.0230	.0739	.0228	.2543	.1683	-.1252	-.1048	1.0000					
WCTIME	-.0315	.0048	-.0063	-.0017	.0320	-.0138	-.0015	-.0105	-.0081	-.0191	-.0148	-.0109	-.0060	-.0050	.0259	.0002	.0794	.0615	.9914	.9915	-.0462	-.0323	.1967	1.0000				
OCTIME	-.0470	-.1658	-.0148	-.0278	-.1123	-.0427	-.0154	.1137	-.0674	.2694	.1679	.0180	.0495	.0200	-.0323	.0646	.6097	.5085	.0164	-.0056	-.3128	-.0186	.2115	.0554	1.0000			
WFARM	.0253	-.0214	.0043	.0060	-.0200	.0036	.4634	-.0566	-.0102	-.0084	-.0139	.0141	-.0026	.0133	-.0049	-.0286	.0019	-.0018	.0077	-.0006	-.0239	-.0336	.0271	.0066	.0083	1.0000		
WNFARM	-.0028	.0356	-.0760	-.0546	-.0746	-.0584	-.0252	.2060	-.0650	.0105	-.0025	-.0066	.0381	.0601	.0022	.0997	.1934	.0825	.0934	.0002	-.2091	-.1024	.4992	.0494	.1768	-.0117	1.0000	
WNSFARM	.0164	-.0269	.0156	.0127	-.0234	.0319	-.0089	-.1279	.4057	-.0604	-.0454	.0160	-.0236	-.0037	.0244	-.0686	.0443	.0124	.0103	-.0013	-.0795	-.0238	.0173	.0132	.0016	-.0041	-.0264	1.0000

TABLE XXIV

HUSBAND'S ATTITUDE TOWARD WOMEN WORKING BY PLACE OF RESIDENCE AND LABOR FORCE STATUS OF THE WOMAN, 1967

PLACE OF RESIDENCE	HUSBAND'S ATTITUDE TOWARD WOMEN WORKING					
	LIKE IT		DON'T CARE		DISLIKE IT	
	WIFE IN LABOR FORCE	WIFE NOT IN LABOR FORCE	WIFE IN LABOR FORCE	WIFE NOT IN LABOR FORCE	WIFE IN LABOR FORCE	WIFE NOT IN LABOR FORCE
SMSA-FARM	13 30.23%	11 25.58%	4 9.30%	5 11.63%	3 6.98%	7 16.28%
SMSA-NONFARM	867 26.80%	838 25.90%	430 13.29%	358 11.07%	407 12.58%	335 10.36%
NONSMSA-FARM	88 32.23%	94 34.43%	28 10.26%	28 10.26%	17 6.23%	18 6.59%
NONSMSA-NONFARM	515 33.77%	443 29.05%	171 11.21%	138 9.05%	122 8.00%	136 8.92%
TOTAL	1483 29.22%	1386 27.30%	633 12.47%	529 10.42%	549 10.82%	496 9.77%

TABLE XXV

SUMMARY OF WOMEN'S ATTITUDES TOWARD A WIFE WORKING[a] BY PLACE OF RESIDENCE AND CURRENT LABOR FORCE STATUS, 1967

	RESPONDENT'S ATTITUDE TOWARD WIFE WORKING									
	DEFINITELY ALL RIGHT		PROBABLY ALL RIGHT		PROBABLY NOT ALL RIGHT		DEFINITELY NOT ALL RIGHT		NO OPINION, UNDECIDED	
	WOMAN IN LABOR FORCE	WOMAN NOT IN LABOR FORCE	WOMAN IN LABOR FORCE	WOMAN NOT IN LABOR FORCE	WOMAN IN LABOR FORCE	WOMAN NOT IN LABOR FORCE	WOMAN IN LABOR FORCE	WOMAN NOT IN LABOR FORCE	WOMAN IN LABOR FORCE	WOMAN NOT IN LABOR FORCE
	IF ABSOLUTELY NECESSARY									
SMSA-FARM	7 16.28%	12 27.91%	12 27.91%	6 13.95%	1 2.32%	3 6.98%	- -	2 4.65%	- -	- -
SMSA-NONFARM	1146 35.53%	926 28.71%	443 13.74%	479 14.85%	37 1.15%	44 1.36%	60 1.86%	63 1.95%	14 .43%	13 .40%
NONSMSA-FARM	84 30.88%	76 27.94%	38 13.97%	53 19.48%	4 1.47%	5 1.84%	6 2.20%	5 1.84%	1 .37%	-
NONSMSA-NONFARM	546 35.80%	435 28.52%	227 14.88%	223 14.62%	14 .92%	20 1.31%	21 1.38%	28 1.84%	3 .20%	8 .52%
TOTAL	1783 35.20%	1449 28.61%	720 14.22%	761 15.02%	56 1.10%	72 1.42%	87 1.72%	98 1.93%	18 .36%	21 .41%
	WANTS TO WORK AND HUSBAND AGREES									
SMSA-FARM	10 23.26%	8 18.60%	8 18.60%	9 20.93%	- -	3 6.98%	2 4.65%	3 6.98%	- -	- -
SMSA-NONFARM	744 23.08%	523 16.22%	591 18.33%	570 17.68%	145 4.50%	155 4.81%	194 6.02%	258 8.00%	25 .78%	19 .59%
NONSMSA-FARM	58 21.40%	49 18.08%	48 17.71%	63 23.25%	13 4.80%	13 4.80%	13 4.80%	12 4.43%	- -	2 .74%
NONSMSA-NONFARM	401 26.31%	260 17.06%	271 17.78%	269 17.65%	64 4.20%	60 3.94%	65 4.26%	116 7.61%	9 .59%	9 .59%
TOTAL	1213 23.96%	840 16.59%	918 18.14%	911 18.00%	222 4.38%	231 4.56%	274 5.41%	389 7.68%	34 .67%	30 .59%
	WANTS TO WORK EVEN IF HUSBAND DOESN'T LIKE IT									
SMSA-FARM	1 2.32%	- -	5 11.63%	2 4.65%	4 9.30%	8 18.60%	9 20.93%	13 30.23%	1 2.32%	- -
SMSA-NONFARM	79 2.45%	64 1.98%	260 8.06%	126 3.91%	448 13.89%	338 10.48%	867 26.88%	969 30.05%	46 1.43%	28 .87%
NONSMSA-FARM	8 2.95%	3 1.11%	18 6.64%	14 5.17%	34 12.55%	34 12.55%	69 25.46%	85 31.36%	3 1.11%	3 1.11%
NONSMSA-NONFARM	45 2.95%	21 13.78%	114 7.48%	62 4.07%	220 14.44%	150 9.84%	399 26.18%	454 29.79%	32 2.10%	27 1.77%
TOTAL	133 2.63%	88 1.74%	397 7.84%	204 4.03%	706 13.94%	530 10.47%	1344 26.54%	1521 30.04%	82 1.62%	58 1.14%

[a] Three hypothetical situations were presented to all the women regardless of their marital status at the time of the survey.

TABLE XXVI

EDUCATIONAL LEVEL OF THE RESPONDENT BY PLACE OF RESIDENCE AND LABOR FORCE STATUS, 1967

		LESS THAN HIGH SCHOOL		HIGH SCHOOL		SOME COLLEGE		COLLEGE		BEYOND COLLEGE	
		IN THE LABOR FORCE	NOT IN THE LABOR FORCE	IN THE LABOR FORCE	NOT IN THE LABOR FORCE	IN THE LABOR FORCE	NOT IN THE LABOR FORCE	IN THE LABOR FORCE	NOT IN THE LABOR FORCE	IN THE LABOR FORCE	NOT IN THE LABOR FORCE
ALL RESPONDENTS	No.	1068	955	1098	1044	248	253	50	115	98	33
	%	21.09	18.88	21.69	20.62	4.90	5.00	2.96	2.27	1.94	.65
SMSA-FARM	No.	7	10	11	10	1	3	1	-	-	-
	%	.14	.20	.22	.20	.02	.06	.02	.00	.00	.00
SMSA-NONFARM	No.	659	564	711	699	167	160	88	84	74	20
	%	13.02	11.14	14.04	13.81	3.30	3.16	1.74	1.66	1.46	
NONSMSA-FARM	No.	56	73	54	52	11	11	8	2	4	1
	%	1.11	1.44	1.07	1.03	.22	.22	.16	.04	.08	.02
NONSMSA-NONFARM	No.	346	309	322	283	69	79	53	29	20	12
	%	6.83	6.10	6.36	5.59	1.36	1.56	1.05	.57	.40	.24

TABLE XXVII

AVERAGE INCOME OF WOMEN SURVEYED, BY OCCUPATION AND PLACE OF RESIDENCE, 1967

OCCUPATION	PLACE OF RESIDENCE							
	SMSA				NONSMSA			
	FARM		NONFARM		FARM		NONFARM	
	AVERAGE INCOME	NUMBER	AVERAGE INCOME	NUMBER	AVERAGE INCOME	NUMBER	AVERAGE INCOME	NUMBER
PROFESSIONAL, TECHNICAL AND KINDRED WORKERS	$2,500.00	2	$5,003.32	199	$3,544.89	18	$4,071.40	97
FARMERS AND FARM MANAGERS	-	-	15.00	1	125.00	1	1,080.00	1
MANAGERS, OFFICIALS AND PROPRIETORS, NOT FARM	-	-	4,660.89	54	-	-	2,271.72	21
CLERICAL AND KINDRED WORKERS	3,298.50	6	3,664.48	528	3,248.95	21	2,781.01	189
SALES WORKERS	-	-	1,880.67	108	1,757.67	3	1,377.14	35
CRAFTSMEN, FOREMEN, AND KINDRED WORKERS	-	-	2,272.52	21	2,256.50	4	4,440.11	9
OPERATIVES AND KINDRED WORKERS	2,740.67	3	3,019.04	331	2,046.33	18	2,250.83	181
PRIVATE HOUSEHOLD WORKERS	910.00	2	1,094.43	163	460.44	16	689.20	96
SERVICE WORKERS, EXCEPT PRIVATE HOUSEHOLD	1,144.80	5	2,222.65	318	761.67	15	1,412.97	148
FARM LABORERS AND FOREMEN	1,890.00	1	827.60	10	252.44	25	464.72	39
LABORERS EXCEPT FARM AND MINE	-	-	1,540.67	3	-	-	2,284.34	6
OCCUPATION NOT REPORTED	-	-	850.00	2	50.00	1	1,777.50	4

TABLE XXVIII

OCCUPATION[a] OF THE RESPONDENT, BY PLACE OF RESIDENCE AND LABOR FORCE STATUS, 1967

OCCUPATION	SMSA				NONSMSA				TOTAL	
	FARM		NONFARM		FARM		NONFARM			
	IN THE LABOR FORCE	NOT IN THE LABOR FORCE	IN THE LABOR FORCE	NOT IN THE LABOR FORCE	IN THE LABOR FORCE	NOT IN THE LABOR FORCE	IN THE LABOR FORCE	NOT IN THE LABOR FORCE	IN THE LABOR FORCE	NOT IN THE LABOR FORCE
PROFESSIONAL, TECHNICAL AND KINDRED WORKERS	2	1	210	127	16	6	94	53	322	187
FARMERS AND FARM MANAGERS	-	-	3	-	5	-	3	1	11	1
MANAGERS, OFFICIALS, AND PROPRIETORS	-	-	68	24	2	1	34	15	104	40
CLERICAL AND KINDRED WORKERS	3	12	512	562	22	26	194	204	731	804
SALES WORKERS	-	-	86	123	5	7	33	51	124	181
OPERATIVES AND KINDRED WORKERS	2	3	318	257	16	15	168	111	504	386
CRAFTSMEN, FOREMEN, AND KINDRED WORKERS	-	-	20	12	4	1	9	5	33	18
PRIVATE HOUSEHOLD WORKERS	1	3	158	99	14	7	94	45	267	154
SERVICE WORKERS, EXCEPT PRIVATE HOUSEHOLD	7	4	317	213	15	13	151	97	490	327
FARM LABORERS AND FOREMEN	5	-	10	8	34	34	25	37	74	79
LABORERS, EXCEPT FARM AND MINE	-	-	2	7	-	1	5	4	7	12
NOT REPORTED	-	-	-	99	-	29	1	94	1	222
TOTAL	20	23	1704	1531	133	140	811	717	2668	2411

[a] Occupation is that last held by respondent.

TABLE XXIX

INDUSTRIAL CLASSIFICATION[a] OF THE RESPONDENT, BY PLACE OF RESIDENCE AND LABOR FORCE STATUS, 1967

INDUSTRY	SMSA				NONSMSA				TOTAL	
	FARM		NONFARM		FARM		NONFARM			
	IN THE LABOR FORCE	NOT IN THE LABOR FORCE	IN THE LABOR FORCE	NOT IN THE LABOR FORCE	IN THE LABOR FORCE	NOT IN THE LABOR FORCE	IN THE LABOR FORCE	NOT IN THE LABOR FORCE	IN THE LABOR FORCE	NOT IN THE LABOR FORCE
AGRICULTURE, FORESTRY AND FISHERIES	5	-	16	15	40	35	32	41	93	91
MINING	-	-	3	2	-	-	2	-	5	2
CONSTRUCTION	-	1	10	4	-	-	6	3	16	8
MANUFACTURING	2	3	356	356	18	20	180	150	556	529
TRANSPORTATION, COMMUNICATION AND OTHER PUBLIC UTILITIES	-	1	57	85	2	3	17	17	76	106
WHOLESALE AND RETAIL TRADE	3	7	335	355	13	23	142	167	493	552
FINANCE, INSURANCE AND REAL ESTATE	-	-	83	97	4	5	18	26	105	128
BUSINESS AND REPAIR SERVICES	-	2	42	33	-	-	10	8	52	43
PERSONAL SERVICES	4	4	269	179	20	11	158	78	451	272
ENTERTAINMENT AND RECREATION SERVICES	-	-	18	20	1	1	7	6	26	27
PROFESSIONAL AND RELATED SERVICES	5	3	429	232	28	11	207	105	669	351
PUBLIC ADMINISTRATION	1	2	85	52	7	2	31	21	124	77
NOT REPORTED	-	-	1	101	-	29	1	96	2	226
TOTAL	20	23	1704	1531	133	140	811	718	2668	2412

[a] Indsutrial classification of latest job held by the respondent.

VITA

Marlys Ann Knutson

Candidate for the Degree of

Master of Science

Thesis: A WOMAN IN THE LABOR FORCE: FACTORS AFFECTING BOTH HER LABOR FORCE DECISION AND THE TIME SHE IS WILLING TO SUPPLY IN THE LABOR MARKET

Major Field: Agricultural Economics

Biographical:

Personal Data: Born in Fargo, North Dakota, July 24, 1950, the daughter of Mr. and Mrs. Russell H. Knutson.

Education: Graduated from North High School, Fargo, North Dakota, in May, 1968; received the Bachelor of Arts degree from Luther College with majors in economics and mathematics in May, 1972; completed the requirements for the Master of Science degree from Oklahoma State University with a major in agricultural economics in May, 1974.

Professional Experience: Served as Research Assistant at Oklahoma State University from August, 1972, to May, 1974.

Professional Organizations: Member of American Agricultural Economics Association, Omicron Delta Epsilon, and Phi Kappa Phi.